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THE EIMCO CORPORATION

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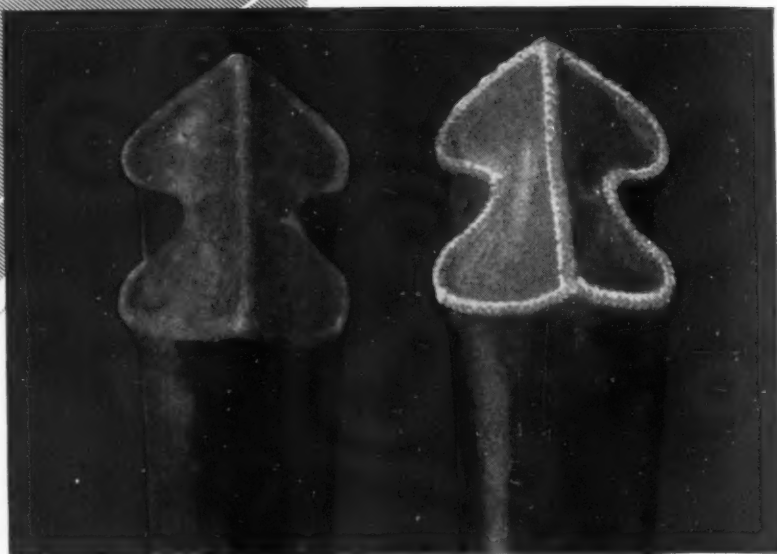
NEW YORK: 31-32 SOUTH STREET, BROOKLYN, N.Y. 11231

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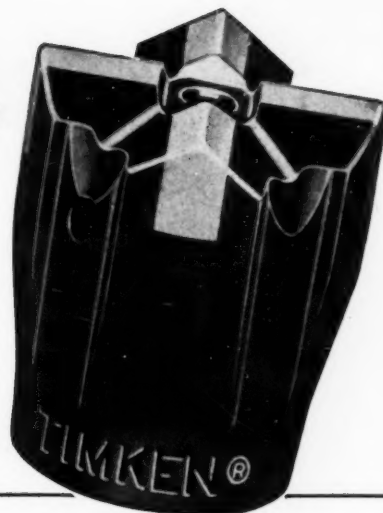
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## Only the Timken Company offers all 3 rock bit types...and a complete Engineering Service!

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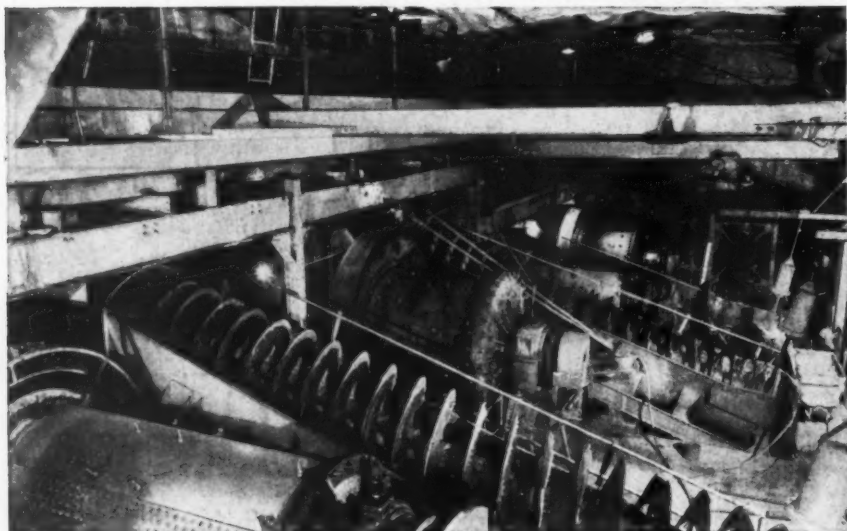
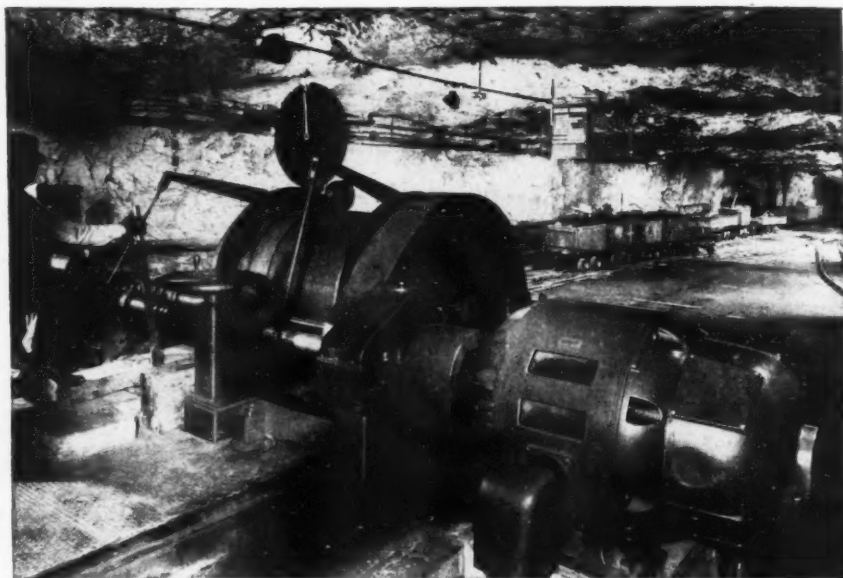
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*your best bet for the best bit  
... for every job*

# Underground lead-zinc mill hits 1200 tons per day!

**1** Hauling cars of lead-zinc ore up 15° slope to the underground mill is this 72" drum hoist, driven by G-E 300-hp 440-volt motor and control. Only one of its kind, the Gilman lead and zinc mill was built entirely underground because in the mountainous terrain surrounding it there is not enough level country. Several hundred feet down, in rooms cut out of hard rock, crude ores from the adjacent mine are concentrated for smelting at distant plants.



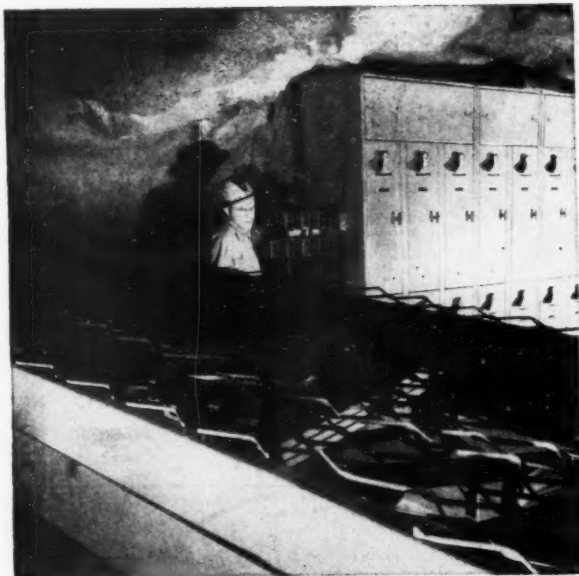
**2** In the underground grinding room, two 100-hp and two 75-hp 440-volt G-E motors and control drive grinding mills. Classifier drives consist of four 10-hp G-E motors and control. Naturally heated to 83F, water for grinding process is pumped from mine to mill by G-E induction motors.

GENERAL  ELECTRIC

660-23



**Co-ordinated G-E drives and distribution equipment help maintain continuity of production at New Jersey Zinc's unique Gilman, Colo. concentrating plant**

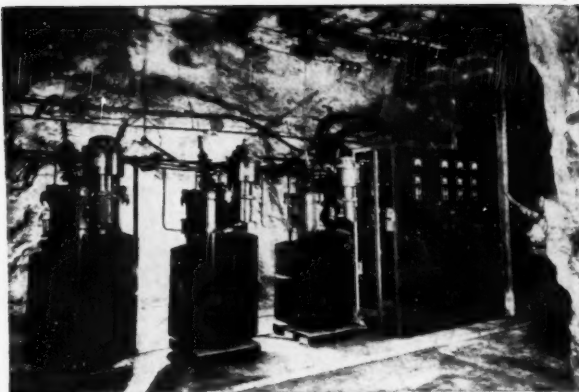


**3** Grouped motor control is provided at several points throughout the mill by compact G-E Cabinetrol\* units. Space-saving Cabinetrol "packages" include all controls and instruments needed for various milling processes. This neat assembly, together with its associated push-button stations, is located in the mill's flotation cell room.

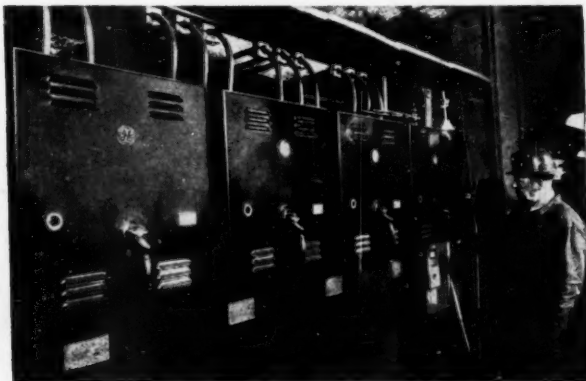


**4** After grinding the ore, lead minerals are separated from zinc minerals and waste, and then zinc minerals are separated from waste tailings in flotation cells. Air for flotation cells is supplied by these blowers, driven by three 125-hp 440-volt G-E a-c motors, with G-E control at right.

\* Reg. trade mark of General Electric Co. for enclosed control panel equipment.



**5** Power for the mine comes down from the surface at 13,800 volts through 4500 feet of G-E armored cable. At this substation—comprising a G-E switchboard and three 150-kva Pyranol† transformers with gas absorbers—it is stepped down to 440 volts for utilization throughout the mine's two lowest levels.



**6** To protect equipment against damage from excessive overcurrents caused by heavy overloads or short circuits, the mill uses four G-E 3-pole air circuit breakers rated 600 amperes, 600 volts. G-E air-circuit breakers, selected for adequate interrupting capacity, help safeguard against loss of production in all milling operations.



**CO-ORDINATED  
EQUIPMENT  
for the Mining Industry**

At every stage in ore processing—mining, concentrating, smelting, or refining—a G-E mining industry specialist can help you solve your electrical problems efficiently, economically. He's a good man to know. Call him soon! *General Electric Company, Schenectady 5, N. Y.*

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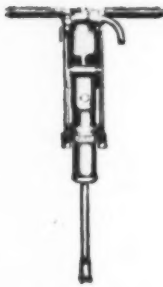
# W



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*Built rugged for long life—balanced for easy handling*



Hand-held rock drills... Available with hand or motor feed mountings. Worthington's efficient jet valve.



Drifters... 3, 3½, 4 in. Special "Pneu-Motor" on shell or drifter (also hand crank).



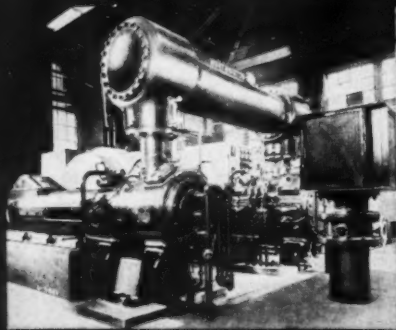
Stoppers... Operating Handle well above center of gravity for easy handling. Positive, sleeve-type valve—minimum wear.



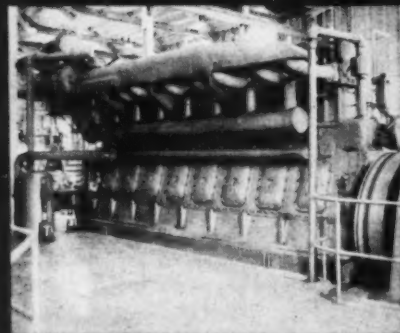
Clay diggers... Built-in ease of handling helps operators get more work done with less fatigue.



Breakers... Hard-hitting tools with soft rubber grip handles for dampening vibration.

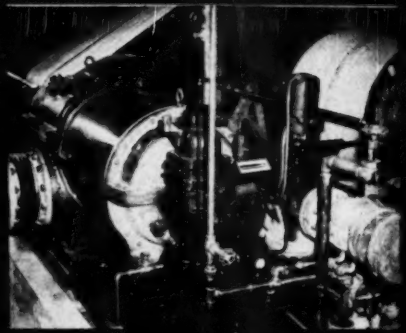


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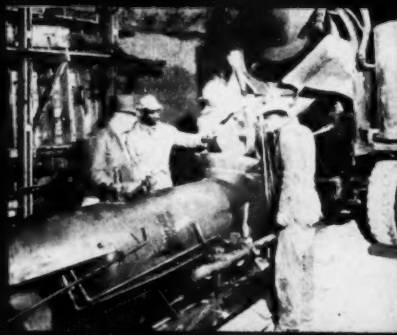
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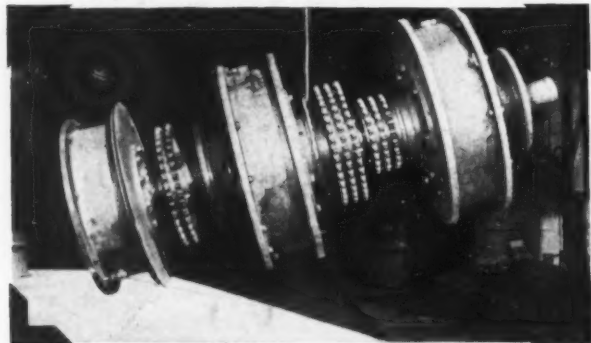
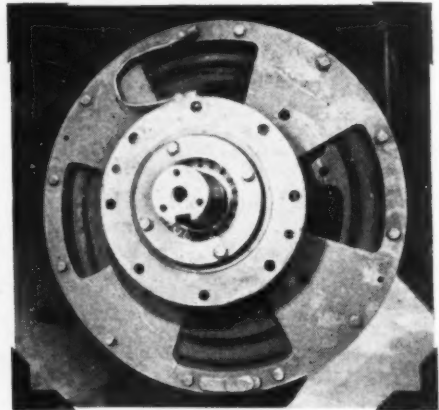
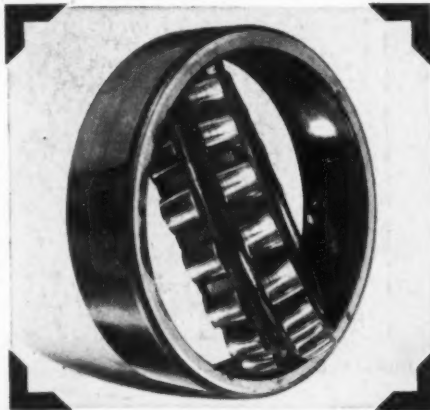


# STANDARD ENGINEER'S REPORT

DATA	
LUBRICANT	<i>Calol SA Grease</i>
UNIT	<i>Heavy-duty roller bearing</i>
LUBRICATOR	<i>Grease gun</i>
CONDITIONS	<i>Loads to 15,000 lbs.-speeds to 800 RPM-Dust, shock</i>
PERIOD	<i>2 1/2 years</i>
FIRM	<i>Ideco, Torrance, Calif.</i>

## Bearings good after 2 1/2 years heavy-duty outdoor service!

THIS BEARING and its mate supported a 2000-pound transmission shaft assembly in an oil-well drill-rig hoist for 2 1/2 years while the unit drilled more than 100,000 feet of hole. Lubricated with CALOL SA Grease, bearings were in good condition (see picture) when checked at the end of that time and were put back in service. As the unit lifted and lowered heavy drill tools, bearings were subjected to terrific shock loads. Dust and grit were always present in the air in the outdoor operation.



THE TRANSMISSION INPUT SHAFT ASSEMBLY was removed from the hoist to repair a flange ring, allowing checking of the bearings. All bearings are hand packed with CALOL SA Grease by the manufacturer of the hoist, Ideco, Torrance, California, before delivery of a unit. Fittings and tubes provide for lubrication with a grease gun on the job.

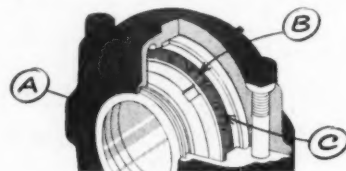


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### How to reduce wear in all types grease-lubricated machine bearings



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- B. Feeds evenly to all bearing surfaces.
- C. Remains soft in cold temperatures.

STANDARD TECHNICAL SERVICE checked this product performance. For expert help on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write Standard Oil Company of California, 225 Bush St., San Francisco.

STANDARD OIL COMPANY OF CALIFORNIA





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**High Voltage Cable**

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Less weight, more flexibility; easier to handle, install,

splice and maintain. Lower first and final costs!

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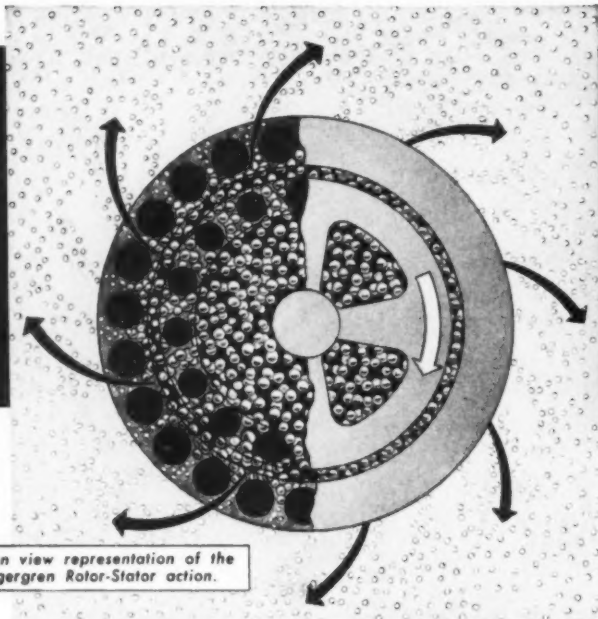
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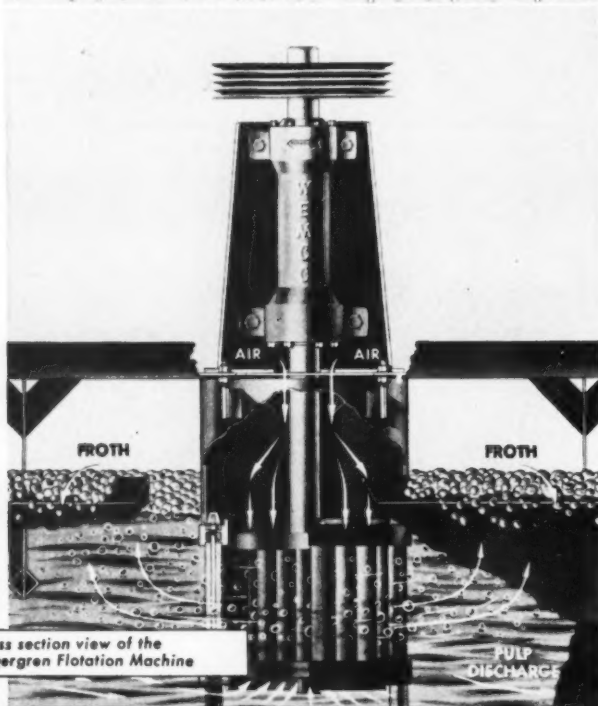
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Plan view representation of the Fagergren Rotor-Stator action.



Cross section view of the Fagergren Flotation Machine

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## IMPROVED METALLURGY WITH FAGERGRENS

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**THIRD** because "mineral dropping" action in the froth is nearly eliminated.

**PROOF OF THESE FAGERGREN RESULTS**, as compared with other type machines, is found in countless applications with a wide variety of ores. The reason for these results is explained by the action of the exclusive, patented rotor-stator.

**THE POWERFUL AERATION OF PULP** and the rapid, uniform dispersion of air accomplished by the Fagergren Rotor-Stator produce smaller, livelier bubbles of greatly increased surface tension. The larger number of **effective** bubbles thus produced results in superior mineral extraction and greater capacity per unit of cell volume.

**REDUCED OPERATING COSTS** also result from the rotor-stator principle since greater aeration and faster mineral removal lower reagent consumption as much as 50% and reduce power requirements. Machine operation is simpler, requiring less operating attendance, and long-life wearing parts cut maintenance.

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It stands up under toughest tests because Tiger Brand is rigidly controlled all the way from raw ore to finished product by United States Steel, of which Columbia Steel Company is the Western producing member.

It spools evenly on drums and gets right on the job with a minimum of break-in time. And those high-tensile steel wires just won't quit! To get all the stamina that's engineered into American Tiger Brand, here's a tip...

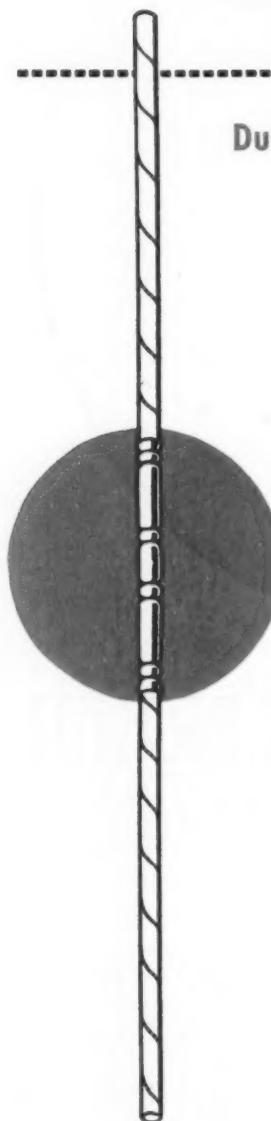
It works hard longer when you take advantage of the services of a Field Specialist. For free consultation, contact your Tiger Brand distributor or write Columbia Steel Company, Room 1422, San Francisco 4.



## U-S-S TIGER BRAND Wire Rope

UNITED STATES STEEL

# A NEW METHOD OF SHORT INTERVAL DELAY FIRING FOR WELL DRILL BLASTS



## Du Pont Primacord "MS" Connectors

1. Increase safety by eliminating electric blasting caps.
2. Allow unlimited flexibility in planning sequence-firing layouts.
3. Greatly simplify the hooking-up operation.

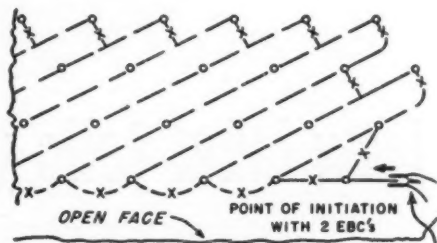
Du Pont Primacord "MS" Connectors consist of a copper tube  $2\frac{3}{4}$ " long containing a delay element that creates an average interval of 16 to 17 milliseconds. At each end of the tube, a 12-inch section or "tail" of Primacord is crimped in place (see sketch at left). These sections are spliced or taped into Primacord trunk lines to provide any desired arrangement of delay firing. Electric blasting caps, either regular or delay, are entirely eliminated from the body of the shot. No caps are needed except for initiation of trunk line, and these are not attached until the shot is ready to fire.

The number of intervals possible is unlimited, and the new "MS" Connectors are readily adapted to a wide variety of blasting layouts. The typical multiple-row drill pattern shown at right provides sequence firing both for individual holes as well as rows. In this arrangement the shot is detonated at the open corner (point of greatest relief) formed by intersection of the face and the free end. Where ends of the shot are tight, the blast can be initiated at the center.

Hook-up operations are simple and fast. Du Pont Primacord "MS" Connectors pro-

vide the most convenient and fastest means yet devised for delay firing from the surface.

"MS" Connectors are proving a valuable addition to existing methods of surface initiation and in many cases will replace use of



x Shows location of "MS" Connectors

blasting timers and short interval delay electric blasting caps. The Connectors are now available in units of 25, packed in cardboard tube with screw top.

Ask your Du Pont explosives representative for additional information or write for Technical Service Bulletin No. 12. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.



BETTER THINGS FOR BETTER LIVING  
... THROUGH CHEMISTRY

## DU PONT EXPLOSIVES

Blasting Supplies and Accessories



# MINING WORLD

and the export edition  
WORLD MINING

**A Miller Freeman Publication**

Published monthly except in April when publication is semi-monthly

## JULY, 1951

VOL. 13 No. 8

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## DRIFTS AND CROSSCUTS

### Good Sense and a Right Viewpoint

Senator Joseph C. O'Mahoney has requested Secretary of the Treasury John W. Snyder for tax aid to spur production of strategic and critical minerals.

This request referred to a provision of the tax bill under consideration by congress as follows:

"I. Amend section 23 (a) (1), by adding a new paragraph (D), as follows:

'(D) *Mine Development Expenditures*. All Expenditures (in respect of which depreciation is not allowable) incurred in development of a mine after the existence of ore in commercial quantities has been disclosed. Such expenditures shall be treated as deferred expense, deductible ratably over the period during which the ore benefited thereby is produced. In no event shall these expenditures be chargeable to capital account recoverable under section 23 (m).

"The amendment made by this paragraph shall be applicable to taxable years beginning after December 31, 1950."

O'Mahoney's viewpoint was: "I am convinced that a provision in the pending tax bill which would make expenditures incurred in prospecting, exploration and development deductible would result in encouraging the investment of private capital by the owners of thousands of mines."

### Mining Still Low on the Totem Pole

Recent releases from Washington indicated how the mining industry was being helped by the accelerated tax amortization plan under authority of the Defense Production Act of 1950.

On May 24, 1951, the Defense Production Authority published a "Facilities Expansion Summary" which showed that 19.4 percent of the applications filed for accelerated amortization in the Basic Materials group had been approved. It further showed that only 13.1 percent of the iron ore mining and 13.4 percent of the nonferrous ores mining applications had been approved. In contrast, 22.4 percent of the iron and steel production and fabrication, 20.0 percent of the fiber glass, 22.7 percent of the pulp and paper, 23.0 percent of the cotton ginning and 25.1 percent of the gasoline, fuel oil and lubricants applications had been approved.

These figures are astounding in view of the recent statement of Charles E. Wilson, director of the office of Defense Mobilization, that "metals are the bottleneck. Weapons and production lines are made from metals. In a period of great military and industrial expansion, the availability of metals sets the scope and the pace."

The mining industry does not need to be told of its importance. All it asks is adequate, qualified representation in Washington and fair and equitable treatment.

G.O.A., Jr.

### COMING CONVENTIONS

July 9, 10 and 11, 1951. IDAHO MINING ASSOCIATION, Sun Valley, Idaho.

October 28 through 31, 1951. Third Congress of the PAN AMERICAN INSTITUTE OF MINING ENGINEERING AND GEOLOGY with a joint meeting of the Geologic Society of America, the Society of Economic Geologists and the American Institute of Mining Engineers. Mexico City, Mexico.

## Helpful Technical Bulletins for Mill Men



From time to time when new Cyanamid Reagents are developed, when new applications for older reagents are made, and when data accumulates on separation processes for mineral dressing and coal preparation, Cyanamid's Mineral Dressing Laboratory publishes "Mineral Dressing Notes." Issues available include:

- # 6 —Cyanidation of Concentrates
- # 9 —New Depressants for Carbonaceous Gangue in Flotation Pulp
- # 14 —Heavy-Media Separation Processes
- # 15 —Flotation Reagents
- # 16D—Dutch State Mines Cyclone Separator Processes
- # 17 —Chemistry of Cyanidation
- # 18 —Coal Preparation

On request, any or all of the foregoing issues will be sent to you. And, if you wish, your name will be placed on our list to receive future issues of *Mineral Dressing Notes* without cost.



AMERICAN

*Cyanamid*  
COMPANY

MINERAL DRESSING DIVISION  
30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK

## DURATION ENLISTMENT

*To the miner let me say that he stands where the farmer does; the work of the world waits for him. If he slacks or fails, armies and statesmen are helpless. He also is enlisted in the great service army.*

WOODROW WILSON.

Under two administrations, the mining industry has spent 19 years in the doghouse. It is, therefore, refreshing to call to mind this saying by a really great American.

What has been the reward for mining's trustworthiness? The iniquitous L-208 order—The silver dollar value stop order—"While I am in the White House there will be no increase in the price of gold."—"I am not in favor of any subsidy for mining."—Scrap depletion!—and others too numerous to mention. Do these statements sound like matured judgments or are they all mere prejudice?

Here, to consider capital investment, accountancy may be profitable. There is a tendency in certain quarters, that should know better, to think that capital investment stops as soon as a mine goes into production. On the contrary, every capital account is constantly changing. In real fact every capital account is, in effect, a revolving fund. As examples let us consider "ore reserves" and "depletion." An easily-understood example is a coal mine. If the capital accounts became static when production started, the prospect drilling rig would then be placed in storage. On the contrary, the rig is kept busy, constantly drilling ahead of the advancing tunnels. This is done to find grades that will favor loads and drainage. The charge is a proper one against unmined coal reserves, and is not an operating expense.

Consider now a large low-grade copper development in Arizona. The prospect drilling has shown that there are areas that contain 30, 20, 10 or four pounds of copper per ton of rock. An average is made for the whole property, and results indicate that operation is desirable. When mining begins an "ore reserve" account is opened with an estimated valuation based on the preliminary drilling. This valuation is subject to constant adjustment, due to continuing long-hole drilling, both above and below the ground, which may continue so long as the mine is in operation. The ore reserve determines the sequence in mining so that the mill flow-sheet may not suffer from malnutrition due to too much lean ore. All expense needed to establish the true value of ore reserve is a capital charge.

Yes, Mr. President, depletion may finally amount to four times the original capital charge, or even more, but is a proper charge caused by the constant expansion of a major industry during 30 or 40 years. Depletion is an important factor in a major industry, adding to the strength of America to the point where would-be enemies will not dare to attack us.

Open season for politics is with us again. As we view the tactics of the leaders of both parties one is tempted to say, "A plague on both your houses!" The miners may be either Democrats or Republicans but they are AMERICANS first of all. Mineral production will not fail if Washington bureaucracy will allow us to work unhampered. WE ARE ENLISTED FOR THE DURATION AND BEYOND.

*The Wanderer*

MINING WORLD



## CAPITOL CONCENTRATES

### OPS Refuses to Raise USA Copper Price to Match World Markets

Primary copper producers have been discussing and wondering about the domestic copper price situation created by the Chilean-United States agreement to pay an extra three cents per pound for metal produced in Chile.

Office of Price Stabilization officials state that a horizontal increase in the present 24.50-cent ceiling is not justified at this time because the average profits of the whole industry are substantially above the 85 percent level recently established by Economic Stabilizer Eric Johnston. Under this formula new price ceilings will not be established if industry profits are 85 percent of the 1946-49 level.

OPS thinking is that the only way out for the copper producers who are now losing money is some form of subsidy or premium price plan. They also suggest an alternative solution of individual adjustments based upon hardship, as provided for in the OPS regulations, although they realize that it will be extremely difficult for high-cost producers to show cause and obtain such relief.

#### • Allocation Cut Explained

According to Administrator Boyd of DMA, the figure of \$10,000,000 for exploration projects, later cut to \$5,000,000 by the Bureau of the Budget, was arrived at after studying the experiences under the exploration grants of the 1946 premium price plan. Too bad the rules of the plan were not copied at the same time.

#### • Incentive Payments Are Needed

According to Otto Herres, who heads the Zinc Division of Defense Minerals Administration, zinc will be in short supply for several years, and it will require incentive payments as well as tax relief to increase the supply substantially. Actually, the same reasoning applies to all minerals and metals needed for the defense program. By a slow and cumbersome route the bureaucrats are moving toward the mine incentive payments principle, losing production and the confidence of the industry on the way.

#### • Increased Authority Requested

Secretary of Interior Chapman has asked Congress to approve amendments to the Defense Production Act of 1950 which would permit the government to build and operate defense plants. This authority, he said, was particularly needed in the minerals field. His suggested changes would permit the government, in the case of metals and minerals, to bear temporary increases in the cost of production, distribution, and transportation that threaten to impair the maximum production of supply of material in any area.

While many observers termed this proposal as tending toward further socialization of the mining industry, Chapman maintained that providing such authority would not mean putting the government into competition with private industry:

"There are various kinds of productive facilities which

are critically needed in emergencies like the present," he said, "which simply cannot be economically operated in ordinary times, and the construction and operation of which involve risks which private industry is not in a position to take. Permitting the government to build such facilities amounts, in one sense, to a kind of stockpiling of industrial capacity. It would help government to make certain of the proper introduction of desired technological processes during the emergency. At the end of the emergency, the government might want to keep the plants in stand-by condition. If conditions are such that private industry could operate such plants with reasonable expectation of a profit, government could dispose of them at a fair price."

#### • Nevada Manganese Contract Signed

The manganese contract signed by the government with the operators of the Three Kids mine in Nevada calls for the delivery of 700,000 tons of manganese over a 10-year period. The price is \$1.50 per long ton unit, with a cost escalator clause. The total contract will be for \$41,250,000. The price will encourage small operators who are looking for contracts.

#### • NPA Reassumes Authority

The National Production Authority, largely because of internal wrangles in DMA, has found it necessary to take back from the Interior Department the authority over production of mining machinery. This change has at least one merit, in that it cuts out one of the "hurdles," as Representative Engle terms the steps in governmental red tape.

#### • Tungsten Production Will Go Abroad

A close scrutiny of the tungsten order, OPS Ceiling Price Regulation 19, shows that although it states "this regulation is effective April 16, 1951," the purchasing program does not actually start until July 1. A floor price of \$63.00 and a ceiling price of \$65.00 are involved, suggested by the Defense Minerals Administration.

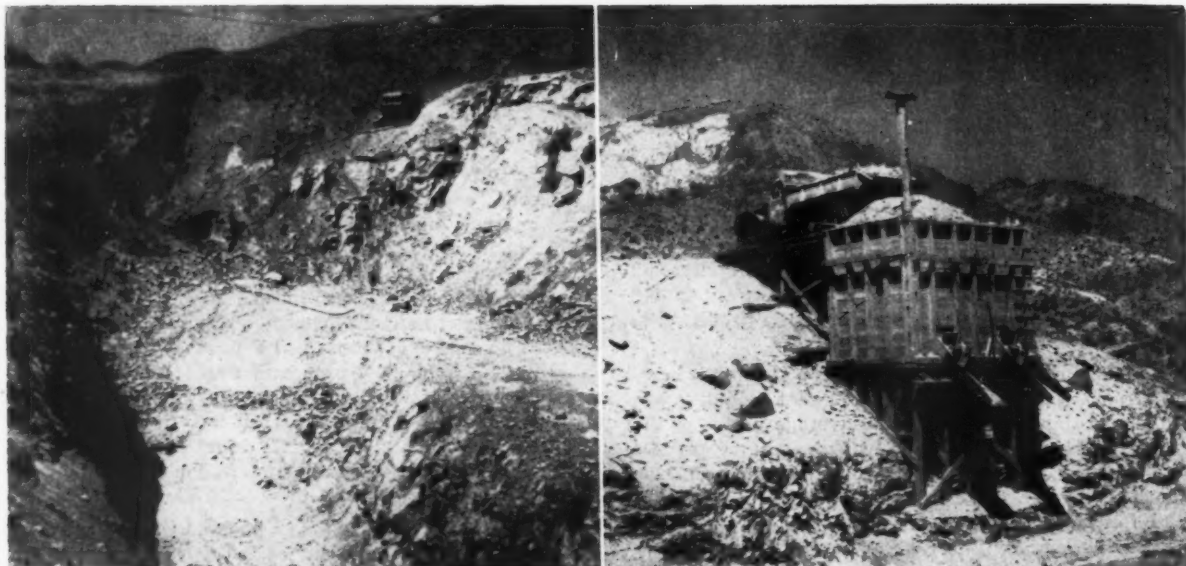
In the justification paragraph, the order states: "It is believed that this price will also result in an increase in shipments of foreign produced tungsten to the United States."

One might as well say that foreign producers are crazy. Other countries want tungsten and are willing to pay for it. At times the foreign price has been nearly \$90.00 per unit. This action will bring down the foreign price, all right, and make tungsten cheaper for Russia, England, etc., but the price still will be above what we are permitted to pay as private buyers and the material will go elsewhere. Such statements seem to be sheer economic nonsense.

#### • Mere Expectations Are Inadequate

Mobilization Administrator Charles Wilson recently announced that foreign nations, not in the Soviet bloc, would be allocated additional supplies of copper, zinc, sulphur and cotton. The statement along with the announcement said, "in return the U.S. expects other countries to show the same consideration in allocating some of their materials to us." It is sincerely hoped that more than mere expectations are involved in this agreement.





LEFT: Viewed from near the orebin, the Starbright pit is following the plunging orebody downward and to the left. Early workings were in the upper right-hand zone; the lower bench has exposed the face of ore for 70 feet along the left side. The Ingersoll-Rand 105-cfm. portable compressor, upper right, furnishes air for the operation. RIGHT: This 80-ton orebin lies northeast of the Starbright and on the edge of the waste dump which extended from the pit. When the bin is full, the Chevrolet 2½-ton truck is loaded with ore and backed up to the bin for extra storage of ore.

## STARBRIGHT---A TUNGSTEN JACKPOT

***A new scheelite discovery, the openpit Starbright mine near Barstow, California, has become a major tungsten producer in less than a year***

In the year 1949, tungsten minerals were not particularly interesting to prospectors and miners. But in the year 1951 tungsten is a magic word—cause for a dream of sudden wealth and a “fever” to find and develop a bonanza property.

The Starbright mine, 25 miles north of Barstow, California, is a 1950 discovery which, going into pro-

duction with the start of the Korean war, has expanded rapidly as a result of increasing demand and rising price for scheelite concentrate, and is now the fifth or sixth largest producer of tungsten concentrate in the United States. Daily production of 60 tons of scheelite ore from the main Starbright pit and a new nearby pit yields approximately 4,000

pounds of 65 percent  $WO_3$  concentrate. In terms of either dollars to Mineral Materials Company or tungsten for our defense effort, the Starbright is important.

### **Float Looked Salted**

A. C. “Al” Lambert was a professional prospector and specifically a tungsten hunter when he found the Starbright. In April, 1950, looking for the deposit from which placer scheelite in the nearby valley had come, Al passed over the Starbright claims, picked up a couple of pieces of float nearly in place, took them home and lamped them. As Al says, “it showed up hot. I figured the float must have gotten salted somehow. So I came back, took a 25-pound sample home in a cement sack, lamped it, and it showed up hotter than the first sample.”

On May 27, Al staked the original four Starbright claims, subsequently staked seven more, and formed a 50-50 partnership with C. W. Dunton, general manager of Mineral Materials Company of Alhambra, California. Later, the partnership

Foreman Joe Courson, miner Art Byers, and manager A. C. “Al” Lambert examine freshly broken scheelite ore under the powerful floodlight of a Model S-61 Mineralight.





leased the property to Mineral Materials Company and Al Lambert now works as manager of the Starbright mines.

The Starbright was opened up by dozing and the initial test run of 24 tons was sent to the Red Mill, seven miles northwest of Bishop, in June; the test run was greatly encouraging. Leasing the El Diablo mill near Bishop, Mineral Materials Company had the mine producing 30 tons daily by July, 1950, had increased production to 50 tons by April, 1951, and, by opening up the nearby deposit in May of 1951, brought production up to about 60 tons daily.

#### Tactite Enveloped in Diorite

The orebody is roughly 70 feet in a horizontal direction by 14 feet high. It is a consistent body that dips 35 to 40° and plunges leftward (southeasterly) to an observer looking down dip. Waste and ore are not easily distinguishable in daylight but are clearly defined when lamped at night with a fluorescent light.

The ore is a typical garnet-rich tactite<sup>1</sup> deposit carrying scheelite  $CaWO_4$ . Streamers of white quartz and inclusions of limestone extend into the ore in places. The entire orebody is surrounded by quartz diorite. On the hangingwall side, a five- to six-foot layer of contact limestone separates the ore from quartz diorite; on the footwall side, tactite ore rests on the quartz diorite.

#### Lamping and Sampling

All mining at the Starbright is done at night, from 4:00 PM to midnight. Frequent use of fluorescent lights provides the means of knowing ore from waste. Ore in place is inspected with battery-powered 6-volt S-43 Mineralights manufactured by Ultra-Violet Products Inc.; the contact between ore and waste is then reasonably sharp and easy to distinguish. In making separations of broken ore and waste, a larger, more powerful Mineralight, the Model S-61, 0.7-ampere floodlamp, powered by 110-volt ac. power is used. All drilling is done dry, and, near the ore zone, drill cuttings lamped frequently with the S-43 show whether the bit is in ore or waste.

A fourth check on mine production is by milling results: Few head samples are taken at the mill, but mill heads are calculated by the known tonnage of feed to the mill,

<sup>1</sup>Tactite is a rock formed by the contact metamorphism of limestone, dolomite or other calcareous rocks into which foreign matter from the intruding magma has been introduced by hot solutions.



Driller Bill Courson operates a Gardner-Denver S-55 Sinker putting down holes in waste just above the orebody. Bill lamps the cuttings frequently and, at about eight feet in this hole, entered the ore and stopped drilling.

the total weight and assay of concentrate, and the assay of tailing. (Percent of  $WO_3$  in the concentrate multiplied by pounds of concentrate divided by pounds of mill feed equals the percent of recoverable  $WO_3$  in the ore.) A 24-hour composite sample of tailing is taken each day, and, assayed, it provides the final means of mining and milling control.

#### Mining—Peel the Orebody

A 1500-watt gasoline-powered Kohler light plant furnishes 110-volt ac. power for floodlights which

surround the pit and for the Ultra-Violet floodlamp.

The mine crew consists of seven men: foreman, truck-driver, operator of the Caterpillar D-2 loader, driller, two muckers, and the operator of the Caterpillar D-8 dozer, which is also used for daytime prospecting and exploration work.

Mining the wide, fairly thick plunging orebody is done by a process that might be likened to peeling an orange. The orebody plunges downward parallel to the horizontal contour of the hill in which it occurs. The first step in stripping is to remove waste above the ore by sinking, in a bench 30 feet wide, down to the sloping top of the orebody. Next, waste is removed from the downhill side of the ore in a similar way. Third, the ore is mined by downward drilling, and when all ore is removed, enough waste is removed from the uphill side to allow room for equipment, and to minimize dilution from that side.

Successive benches are established down dip from each other. The orebody will be surface mined as far as possible; the limit of the surface operation is close at hand.

#### Spring 12-Foot Holes

An Ingersoll-Rand 105-cfm. portable compressor supplies air for the drilling. All drilling is done vertically with two Gardner-Denver S-55 Sinkers using Timken 7/8-inch hexagonal steel in two-foot changes

The most important scheelite-producing area of the United States lies in southeasterly California and extends northerly through Nevada. The Starbright is the most southerly important producer.

Numbers on the map indicate:

1. Getchell and Riley mines.
2. Nevada-Massachusetts, now producing about 400 tons of ore daily.
3. Gabbs Exploration Co., an important new hubnerite mine.
4. Lindsay Mining Co., Nevada Tungsten Corp., and Tungsten Carbide Co. in the Mina-Luning-Rawhide area.
5. Black Horse mine, an important new scheelite pit.
6. USV Co. and other producers of the great Bishop area.
7. The historic "spud patches," placers, and lodes of Randsburg and Atolia.
8. Fresno Mining Company's Strawberry mine.
9. The high country of Alpine county, California.
10. A promising new strike of high-grade scheelite in the high Sierras of Placer county, California.
11. Gardnerville, Nevada, where tungsten miner David G. Wood received the first DMA exploration loan.





**LEFT:** Leonard Steen, operating the Caterpillar D-2 with Traxcavator loader, trips a skip-load of ore into the Chevrolet truck driven by John Sluka. Because the scheelite-tactite ore is unusually heavy, Leonard handles less than a full scoop of ore each time. **RIGHT:** Standing on the ground, Al Lambert talks to Earl Dye, a young friend who is sitting in the seat of the Caterpillar D-8 that is used for exploration, prospecting, and some pit work. The ripper has allowance for five teeth, but is fitted with only three teeth so that it will dig better in unblasted rock.

up to 20 feet. Timken carbide-insert bits starting with a two-inch gauge are used to cut the hard rock.

The miner sinks holes vertically on five to six foot centers. If the hole is 12 feet or deeper, it is usually sprung with one stick of powder. The miner loads the hole with  $\frac{1}{2}$  stick of Hercules 60 percent Tamp-tite  $1\frac{1}{8}$  by 8 inch stick powder per foot of hole, stems the hole with waste sand and sets off the blast by lighting the fuse attached to a Hercules No. 6 cap.

In loading operations which do not require a high degree of sorting, the ore is loaded into a truck by a Caterpillar D-2 tractor with a one-yard front-end, skip-loading attachment—Traxcavator manufactured by Trackson Company. For close sorting, a mucker uses a hand shovel to pile ore where the skip-

loader operator can load it into the truck.

The operator of the Chevrolet  $2\frac{1}{2}$ -ton truck with a  $7\frac{1}{2}$ -ton dump body, used for all pit haulage, dumps waste at the end of an extending, horizontal waste pile, dumps low-grade ore in another special pile, and dumps ore into an 80-ton wood-frame orebin at the end of the waste dump. Mineral Materials Company constructed the orebin with a  $60^\circ$  bottom because the tactite-scheelite ore tends to hang up on the usual  $45^\circ$  bottom.

Jimmy Nicholas of Big Pine, California, hauls the ore to the El Diablo mill on a contract arrangement. He operates a fleet of one International and two GMC highway Diesel trucks which are used mainly for mineral haulage between Reno, Nevada, and Los Angeles, California.

The El Diablo mill is leased and staffed by Mineral Materials Company. Gene Stockman is superintendent of the mill, which is a gravity plant consisting of jaw crusher, cone crusher, vibrating screen in closed circuit with the cone, a ball mill, concentrating tables, dryer, and a magnetic separator to eliminate iron minerals. Magnetic-separator rejects contain approximately 0.75 percent  $WO_3$  and are sold to U. S. Vanadium Company's new custom-milling plant at Pine Creek, near Bishop, California.

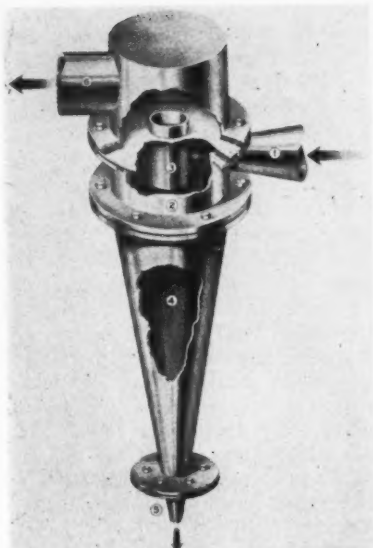
#### **Just the Beginning**

Gene Kraft's contract diamond drill is now exploring the first Star-bright orebody. Six holes drilled to date reveal that the orebody is persistent to at least 100 feet down dip. A hole piercing the orebody and going into the lower granite was barren through its entire 100 feet of granite. As soon as drilling shows the ore structure conclusively, and as soon as surface operations have been completed, Mineral Materials Company will sink an inclined production shaft to develop the body for underground mining.

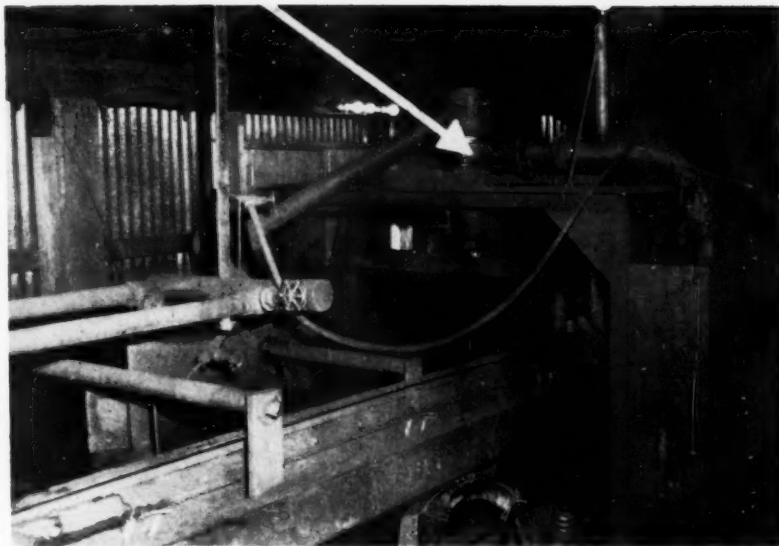
Meanwhile, further bulldozing with the Caterpillar D-8 has opened the second deposit for surface production during the period when the first orebody is tied up by sinking operations. And in further exploration work, Mineral Materials has, as Al Lambert puts it, "laid open the contact structure on its holdings for about a mile with the Caterpillar D-8 and ripper. The two spots we're working now are just the beginning."

Miner Bill Courson and manager Al Lambert use a small S-43 Mineralight to lamp cuttings from a drill hole on the upper bench. Bill has drilled about eight feet vertically with the Gardner-Denver S-55 Sinker in the background and has just cut the ore.





Staatsmijnen in Limburg (Dutch State Mines) developed processes using the cyclone separator for the treatment of fine-sized ore particles.



Heart of the pilot plant is the 7½-inch Cyclone Separator (see arrow) and media draining screen. The Buckeye pilot plant of the Hanna Ore Mining Company treated hematite (with some magnetite) ranging in size from minus-3/16-inch to plus-100-mesh. Media was a water suspension of magnetite at about minus-100-mesh.

## DUTCH STATE MINES CYCLONE LOWERS SILICA IN MINUS-3/16-INCH, IRON-BEARING MATERIAL

### Successful Pilot Plant Tests at Hanna Ore Mining Co.'s Buckeye Mine results in New Mill to Treat Material Not Amenable to HMS

A full scale commercial plant, utilizing the Dutch State Mines Cyclone, is now under construction at the Buckeye mine near Coleraine, Minnesota. The Buckeye mine is operated by The Hanna Ore Mining Company (The M. A. Hanna Company, Agents). The new plant will handle minus-3/16-inch material that is not amenable to treatment in the regular Heavy-Media Separation circuit. Using two 12-inch cyclone separators, the mill will be capable of handling about 125 tons per hour of hematite ore.

Mill construction was preceded by more than one full season of test work which included seven months of pilot plant operation with the cyclone and a shorter period with a drum-type separatory vessel.

The purpose of this article is not to discuss the various phases of the cyclone testing work; but, rather, to outline the general results and describe the successful operating technique developed in the pilot plant.

The Dutch State Mines Cyclone Separator in general form is not too

unlike the cyclones commonly used in dust collection systems. It is somewhat higher and of smaller diameter and its construction is, of course, much heavier—it is cast of Ni-Hard alloy. The accompanying cut-away drawing of the cyclone shows the general design of the unit.

Hanna, like most operators of beneficiation plants on the iron ranges, is concerned with the problem of treating fines. HMS does not worm efficiently in treating fines, but has worked well on materials larger than ¼-inch—even down to ⅛-inch in some cases. In most places, smaller sizes are treated just the way they were handled at the Buckeye—washed in a classifier and blended with the coarse concentrate. Actual practice was to make a coarse product that could be diluted with the only slightly beneficiated fines without dropping the mixture below the desired grade.

At the Buckeye, iron content is good. However, silica in the ore runs 13 to 35 percent and has to be reduced below 11 percent to be ac-

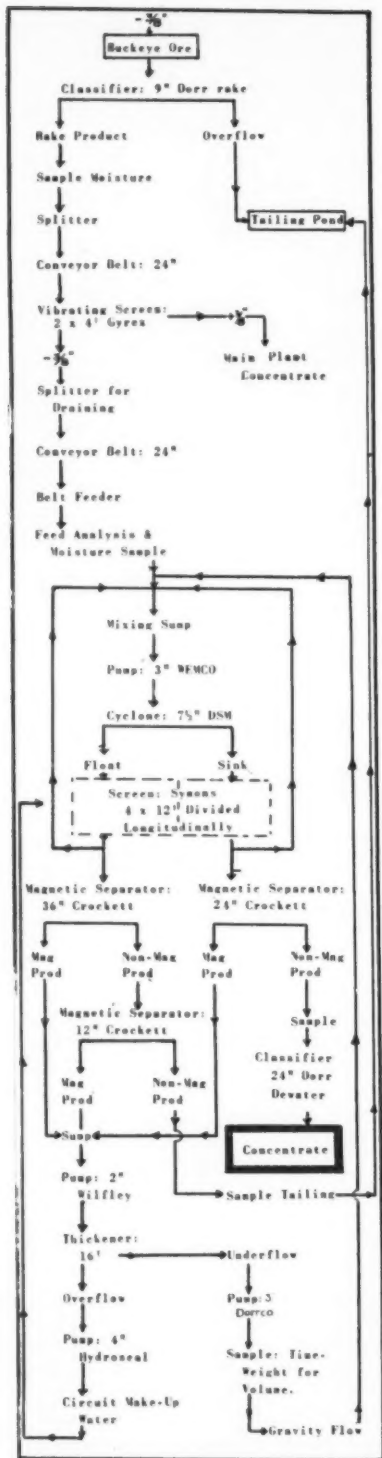
ceptable. Even with this relatively simple problem, washing was not an entirely satisfactory answer. Experiments were conducted with the cyclone in an attempt to extend the HMS range to the smaller sizes.

Actual pilot plant operation started near the end of 1949 and was continued throughout the 1950 operating season before the decision to build a commercial plant was reached. The cyclone was chosen over the drum separator which was tested principally because of the greatly superior metallurgical results obtained with the cyclone and also because the cyclone could treat material from ⅜-inch to 100-mesh while the drum separator could only treat the plus-28-mesh fraction efficiently.

#### Plant Simple—Different

Key units in the system were the 7½-inch cyclone, a screen for draining media, a pump to control the pressure at which pulp was fed to the cyclone and wet, magnetic separators to recover media from the





**FLWSHEET**  
**BUCKEYE MINE**  
 DSM-CYCLONE PILOT PLANT  
 M.A. HANNA CO., AGENTS  
 Coleraine, Minn. 1951

treated material. Briefly, feed was mixed with some new and some circulating media from the draining screen to produce a pulp of about 80-percent solids. The pulp was pumped into the cyclone at a pressure of 25 to 30 pounds per square inch. Waste material was delivered to the screen through a port near the top of the cyclone. Concentrate discharged onto another portion of the same screen through an opening at the apex of the cone-shaped (bottom) portion of the cyclone. The sink passed to one magnetic separator and float to another. Recovered media was pumped to a 16-foot thickener for return to the circuit.

Normal operating procedure is to truck ore from the Buckeye pit, crush it, screen it at 3/16-inch and send the screen oversize to a standard HMS circuit for treatment. Screen undersize is washed in a nine-foot rake classifier and the rake product is mixed with the concentrate from the HMS plant for shipment. The pilot plant cut out 12½ tons per hour, about one tenth, of the flow and diverted it to the cyclone circuit.

This portion passed over a 2 by 4 foot screen with 3/8-inch cloth to scalp off any large chunks. Undersize was carried on a 24 inch conveyor belt to a 4 by 4 by 5 foot mixing sump. The moisture content of the feed is reduced by about five percent as it moves up this belt.

The sump, a welded-steel rectangular box, has two baffles set in such a manner that when feed, new media and recirculating media enter at the top they flow down one baffle and up over the other. This setup creates a whirling action that provides satisfactory mixing of the pulp. The mixture drawn from the bottom is about 80 percent solids.

A three-inch centrifugal pump with a variable-speed drive delivers the pulp to the cyclone. Pressure is controlled by adjusting the pump's speed, constituting one control of the circuit. Operating pressure varies from 25 to 30 pounds per square inch. The most important control is the density of the media used.

Feed at about 80 percent solids enters tangentially through the feed inlet (1 in illustration page 17) to the vertical portion of the cyclone (2). Pulp whirls so that the action of centrifugal and centripetal forces cause a separation in the cone-shaped portion (4). Lighter parts of the pulp rise and flow off through

the overflow (6) while the heavier material is discharged through the apex opening (5). Concentrate and waste both flow onto a divided 4 by 12 foot screen, and some media is drained back into the circuit.

Screen area for concentrate is much larger than for waste, and flow over the screen is hindered so as to provide maximum drainage from the sink product. The cyclone tends to thicken the media as it separates the ore. Thus, the media drawn off with the concentrate is of higher specific gravity than that coming off with the float, and little media is drained from the waste product for immediate reuse. An adjustable plate under the screen enables the operator to control the amount of media returning to the circuit.

No attempt is made to wash media from the separated products as is customary in HMS circuits. Instead, the entire flow of the sink product, except for the media drained at the screen, is sent to a 24-inch magnetic separator. The non-magnetic material from this machine, the final concentrate, is dewatered in a 24-inch rake classifier and sent to join the finished product from the main plant.

All float material from the cyclone flows to a 36-inch magnetic separator. The non-magnetic portion is retreated in a 12-inch magnetic separator, and the magnetic concentrates from all three machines are pumped to the 16-foot media thickener.

During the first two months of operation, orthodox washing of material on screens to recover media was practiced. Because the material was so fine, much screen area and an unusual amount of washing was necessary to make a satisfactory recovery. The method described above was found to offer several distinct advantages. Media loss was lowered. Simpler plant arrangement was achieved. Initial cost of magnetic separators was lower than screens. Operating cost was also less because of elimination of the high cost of screen cloth replacement.

#### Variables Affect Control

As stated earlier, the pressure at which pulp is introduced into the cyclone is one means of controlling forces within the cyclone. In general, separation of finer sizes require higher pressure than that required for coarse material. If pressure is too great, only a thickening



action results. All solids go down and no separation is achieved. If pressure is too low, tailing will be discharged through the bottom orifice.

Changes in the size of the feed inlet, the apex opening and the top orifice and the relation of the size of each opening to the others has a marked effect on results obtained as well as on the capacity of the cyclone. For example, any reduction in the diameter of the apex opening will increase the specific gravity at which the separation takes place. The 7½-inch cyclone at the Buckeye had a one-inch apex opening and a two-inch vortex finder (see 3 in illustration).

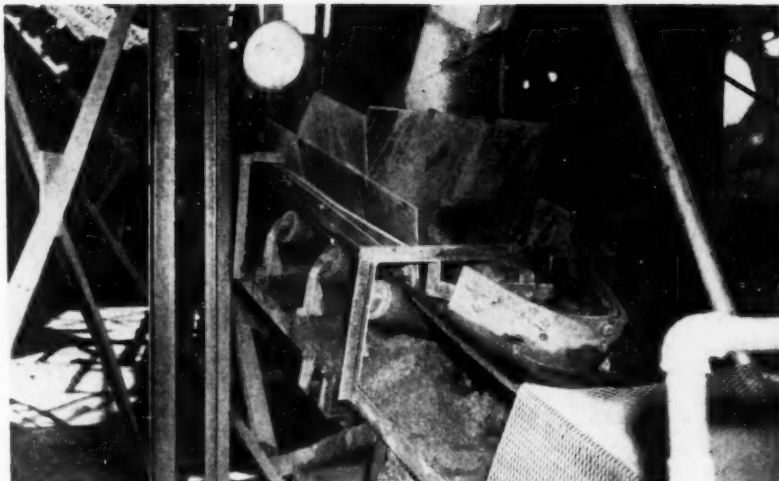
Media is a water suspension of magnetite. The new medium, added to make up circuit losses, is all minus-100-mesh. However, a certain amount of magnetite is picked up from the ore by the magnetic separators so that the average screen analysis of the media is about five percent plus-65-mesh and 70 percent minus-325-mesh. Ferrosilicon may also be added to the media in varying amounts if the separating gravity desired is higher than can be obtained with magnetite alone.

This pick up of magnetite creates no special problems. In fact, it tends to reduce the cost of media.

#### Effect of Specific Gravity

In a static pool, the point of separation is approximately the same as the specific gravity of the medium. In the cyclone separator, due to the centrifugal force, it seems that the point of separation is 0.5 to 0.7 greater than the specific gravity of the media.

On Buckeye ores, the separation in a static pool is made at a specific



This interesting device accomplishes what some engineers claim is impossible—dewatering of material on a conveyor belt. Feed drops into a hopper and a splitter spreads it on the belt in such a manner that a trough is formed down the center. Note the water draining from the device and flowing down the belt. The device reduces the moisture content of the feed about five percent before it is mixed into the media.

gravity of about 3.00. To translate this into mill practice, specific gravity of media returned from the thickener is held at 2.70. Media from the drainage screens is 2.35. At the mixing sump, the media are introduced in the proper proportions so that when further diluted by the water contained in the mill feed the pulp entering the cyclone will have a specific gravity of about 2.30 to 2.50.

Media entering the circuit is controlled by means of the baffle plate under the screen (described earlier) and by volume returned from the thickener. At the thickener, a diaphragm pump delivers the thickened media to a launder which is fitted with an adjustable divider. This baffle divider diverts the desired amount of media to the mixing sump

and lets the balance return to the thickener.

#### Results Speak Fluently

Discussing their findings in a general way, the engineers in charge of the pilot plant state that they were very satisfied with the performance of the cyclone separator. Feed entering the circuit ranged from 13 to 32 percent silica, and the commercial objective was to reduce this to 11 percent with a minimum iron loss. To achieve this at all times was possible, even when the ore carried a higher than average percentage of heavy middling. In fact, it seemed possible to hold silica content of the concentrate constant at almost any desired point.

The plant was about 98 percent as efficient as heavy liquid separation in a beaker in the laboratory.

LEFT: Stephen E. Erickson, beneficiation engineer, under whose direction the pilot plant work was done. CENTER: William Rantala, pilot plant foreman, and Paul Russell, metallurgist. RIGHT: Fred E. Fredrickson, Buckeye mill foreman.





The Wild Goose dredge before starting operation on Crooked Creek, Alaska, in September 1910. The dredge commenced digging on claim No. 27 Above Ophir Creek.

## WILD GOOSE MAKES TRIP NO. 3

*After 41 years of dredging on Alaska's Ophir Creek, the Wild Goose Dredge still nets rich cleanups for 3 Sourdough owners*

After reviewing favorable results from placer sampling of its holdings on Ophir creek, Alaska, the Wild Goose Mining & Trading Company ordered construction of a bucketline dredge on Claim No. 27 Above Discovery. Yuba Construction Company of San Francisco (now Yuba Manufacturing Co.) finished the dredge prior to the end of the 1910 season and, named the Wild Goose, it went into action. While the dredge was still under construction, Chester Milligan came to Nome in his search for gold. Shortly after the Wild Goose went into operation, Chester went to work on her. During the last 41 years, Chester has kept track of the dredge at all times, has worked on her from time to time, and now owns a one-third interest in the ancient but still profitable Wild Goose, now known as the Sourdough.

### First Trip Took 14 Years

At the time she was built, the Wild Goose was equipped with a revolving screen, gold tables to recover gold from the screen undersize, and a stacker belt to carry tailing clear of the hull. Power for the pump, bucketline and stacker was supplied by a single 125-hp. gas engine. The drive by a single gas engine (new at the time) proved economical even though distillate fuel, which sold for seven cents per gallon in San



Chester A. Milligan, senior partner in the Sourdough Dredging Company, spends the winters in Seattle. He is checking over the company's purchases for the 1951 dredging season.

Francisco, California, cost 30 cents per gallon delivered to the camp, 72 miles northeast of Nome.

In 1912, operating cost on the Wild Goose was low, about 12 cents per yard digging an average of 2,000 yards per day at depths of about 10 to 12 feet and digging into fine-grained blue limestone bedrock to a depth of four feet at times. Similarly sized steam-driven units on the Seward peninsula operated at two or three times that cost per yard.

Under the direction of its presi-

dent, Dr. J. Dennis Arnold, its manager, Fred M. Ayer, and its engineer, Charlie Monroe, Wild Goose Mining & Trading Company took a fortune in gold out of Ophir creek; and a big money maker was the Wild Goose dredge which dug forward at about 13 feet per day over a width of about 400 feet. Incomplete sampling and dredging records from portions of the ground indicate that gold recovery was \$1.00 to \$1.50 per yard, and the dredge, averaging 2,000 yards per day, worked 110 days per year for 14 years. The dredging season on Ophir creek lasts from about July 1 to October 20.

### Wild Goose Meets Blue Goose

In 1924 the Wild Goose arrived at Claim No. 13 Above, where it met the Blue Goose dredge coming up Ophir creek. Before the two dredges met, Wild Goose Mining bought the Blue Goose dredge, a 3½-cubic-foot, steam-driven bucketline, from its owners, Dr. Kettleson and Mr. Jafet Lindeburg. With the last of its ground dredged, and with a total estimated recovery (from both hydraulic and dredging) of \$42,000,000, Wild Goose Mining & Trading Company liquidated its holdings, among which was the bucketline dredge at No. 13 Above. Five partners decided to buy the dredge; William A. Oliver, Thomas J. Shaw, Hans Hansen, Nels Trollson, and

Fritz Mebs (who is now living in San Diego) put up \$2,000 apiece and bought the Wild Goose for a total price of \$10,000.

The new partners turned the Wild Goose around, worked her upstream, took a 150-foot cut on the starboard limit. The re-dredging proved profitable and the partners, taking her slowly upstream, arrived at No. 26 Above in 1941. From 1941 through 1945, inactivated by gold-closing order L-208, the dredge lay idle at No. 26 Above.

### Third Trip Proves Profitable

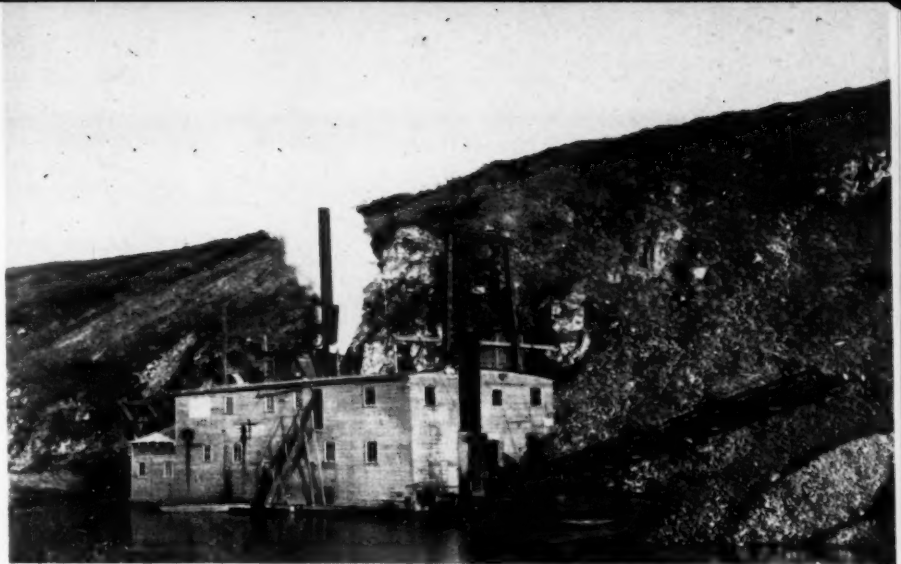
In 1945, three partners, Chester Milligan, Jack LaCross, and G. C. Boyle, investigated the possibility of making money by taking the Wild Goose for a third trip on Ophir creek; they decided that even though the ground had been dredged twice they could make money by cutting corners; another fact they discovered was that coarse gravel had weathered during exposure and the weathering made possible recovery of gold that was not free during the first two trips. The new partners, operating today as the Sourdough Dredging Company, have rechristened the dredge as the Sourdough. H. E. Janeway has succeeded G. C. Boyle as the third partner.

When they began operations in 1946, Sourdough's partners converted the dredge to her present form by taking out the revolving screen, gold tables, and stacker belt and installing a flume with Hungarian riffles.

### Hungarian-Riffled Flume

This is the way the Sourdough is equipped today: The bucketline has 64 four-cubic-foot buckets which travel at a speed of 24 buckets per minute and dig to a maximum depth of 27 feet. The buckets are manganese-steel buckets made for Yuba Manufacturing Company by Taylor-Wharton Iron & Steel Company. The bucketline dumps gravel onto an inclined plate which leads to the mouth of the flume. A 12-inch Dayton-Dow centrifugal pump sends a 6,000-gpm. stream of wash water against the underside of the inclined plate. The stream of high-velocity water breaks up loosely cemented gravel and carries it cleanly into the mouth of the flume.

The flume is 40 inches wide, 106 feet long, and has sideboards three feet high; it slopes downward toward the stern of the dredge at 13 inches in 12 feet and discharges freely over the stern. The riffles are railroad rails 2¼ inches wide mounted in inverted position 1¼



This is the Blue Goose dredge, a 3½-cubic-foot, steam-driven, bucketline dredge which met the Wild Goose at Claim No. 13 Above, in 1924. In 1934, Hugh Pearson bought the Blue Goose from Thomas Shaw and Hans Hansen, dismantled and moved it 4½ miles to the Niukluk River, where it operated very successfully until it was closed down two years ago.

inches apart with a ¼-inch pitch.

By the years of dredging, Ophir creek has been widened to about 50 or 60 feet and is now shallower, only one to three feet in depth. The gravel is medium in size and contains much of the original limestone bedrock. The total gravel burden now averages 13 to 15 feet.

The dredge crew "cleans up" every two weeks, and recovers \$4,000 to \$10,000 in 875-fine gold. About 10 percent of the gold is coarse, in nuggets, and the remaining 90 percent is medium size, about the size of pinheads.

The dredge operates 24 hours per day in two 12-hour shifts with three men on each shift: winchman, oiler, flumeman.

Breakdowns are not a serious problem. As Chester Milligan explains it, "though the dredge was built in 1910, Yuba has detail drawings of every part. We tell them to send us a lower tumbler, not giving the part number, and they shoot it up to us; we know it will fit."

### Electrical Power Pelton-wheel

Of Sourdough's Pelton-wheel power plant, Chester Milligan says, "We have the best plant on Seward peninsula." A ditch carries water from the Sawtooth range at the head of Ophir creek to No. 15 Above (the camp site) where a 175-foot static head is available. The column pipe to the Pelton wheel reduces from 30 inches diameter at the ditch to 16 inches in diameter at the input to the 51½-inch Pelton wheel. Two four-inch nozzles, jetting water on the wheel cups, turn the wheel at 190 rpm. The wheel is connected

by flat belt to a General Electric, 3-phase, 2200-volt, 180-kva alternator which turns at 900 rpm. A similar 200-kva alternator is kept in standby. All motors on the dredge are 2200-volt motors.

The Sourdough dredge is now at No. 19 Above. The three partners, Milligan, LaCross, and Janeway, are on the job starting the 1951 season. At No. 15 Above, where Dutch creek flows into Ophir creek, Sourdough has started an auxiliary operation using dozers and a flume. Two tractor dozers, an International TD-18 and a Caterpillar D-4, push gravel into a hopper, and the normal flow of Dutch creek is fast enough to carry the gravel through the flume.

### Future of Sourdough

Next fall when the ditch to the Pelton wheel freezes over and power from that source is no longer available, Sourdough will use a new diesel-generator unit as its source of power; the unit will extend the dredging season until Ophir creek itself is no longer dredgable.

Sourdough owns a total of 69 claims extending down to Discovery and has leased the ground from No. 1 Below to No. 7 Below from the Alaska Placer Company of Nome. The way is clear, and the old Wild Goose will dredge all the way down to the Niukluk river on this cruise. As Chester Milligan says, "she's still a good dredge today, sound as a twenty-dollar gold piece, and she has a lot of ground ahead of her. If the gold miner gets any sort of break, we'll take her in to the Niukluk, but right now we're operating on a slim margin."



Muriel Sibell Wolle Describes

## SNEFFELS DISTRICT MINES

High on the slopes of some of Colorado's ruggedest mountains lie a group of famous mines. In the 1870's prospectors from Silverton first climbed laboriously over these high peaks, and from their jagged crests looked across the deep valley to towering Mt. Sneffels and down into the Yankee Boy and Imogene Basins. As early as the winter of 1875-76, George Edward Wright worked his way over the range on snowshoes and staked a claim which he called the Wheel of Fortune—the first test of its surface ores assayed 1,200 ounces of silver to the ton. By 1877, other rich lodes had been discovered—the Yankee Boy, the Weston and the Virginius, all near or above timberline, and prospectors had begun to sift steadily into the new mining district. As the area opened up, the Revenue, Ruby Trust, Atlas, Hidden Treasure, U. S. Depository, Bi-Metallist, Potosi, Humboldt, Governor and Senator mines were located and developed.

In 1884 the Thatcher brothers of the Mining and Milling Bank of Ouray financed the construction of the Revenue-Tunnel, spending \$600,000 on the venture before it was

completed. The tunnel started at the creek and was driven to cut the Virginius vein.

In 1898 the Virginius-Revenue Tunnel was spoken of as the "most important mining enterprise in the state." It employed 600 men; its mill handled 300 tons of ore a day and several six-horse teams hauled crude ore as well.

Farther up the valley, on a steep mountain slope above Sneffels Creek, stands the empty, many-windowed mill of the Atlas mine. Below it looms the three-story boardinghouse, its windows and doors gaping wide. In 1898 the mine shipped high grade ore, one sack containing ore with an estimated value of 1,280. Even in 1916 it was listed as one of the principal producers of Ouray County, but by 1927 it had closed down. Beyond it is the Ruby Trust, its old, broken, mill-machinery bleaching next to a new tunnel which was being worked by lessees the last time I saw it. The shafthouse of the Governor mine, still farther up the road, was a weathered, empty shell and beyond it rose the snaggle-toothed top of the range. On my way back to Ouray

I tried to picture this road as described by a newspaper reporter in 1899:

"Fully a mile of freight is handled daily both ways between Ouray and Sneffels . . . by hundreds of stalwart horses and mules, from six to 20 to a team. Besides them, several hundred burros are employed as pack animals every day and the Ouray Sneffels road is a continual blockade from 7:00 a.m. until night . . . Log teams start out and make double trips into the timber every day for the five months of the summer season and thousands of huge logs are hauled to the mine every fall, where a complete sawmill and lumber dressing plant turns out the necessary material for underground workings and surface buildings. Two stages make daily trips, carrying passengers, mail and express, and Brown's Dairy wagon delivers 150 gallons of milk and cream to the mine and mill boardinghouses daily.

The ledge-road to Sneffels from Ouray is steep all the way and the last two miles are narrow and rough, but long before the Revenue-Tunnel is reached, the great Camp Bird property fills the canyon with its mills, tailing ponds and office buildings. This is the mine that made Thomas F. Walsh a millionaire and which produced \$4,000,000 in six years (1896-1902). Up to 1909 dividends of \$5,000,000 were paid. Walsh did not discover the lode and did not even own the fabulous property until late in 1896. Its history begins in the seventies.

Bill Weston returned in 1877 from London, where he had studied at the Royal School of Mines, and headed west for the San Juan. In Del Norte he bought a miner's outfit and with his burros worked his way over Stony Pass, down Cunningham Gulch, through Silverton, up Mineral Creek and over the divide by way of Commodore Gulch into Imogene Basin in the Sneffels district. There he met George Barber, an Englishman and a good miner, and the two men formed a partnership. They staked seven claims—the Ger-

(Continued on Page 84)

The Camp Bird mine high in Colorado's Imogene Basin.





## ACTIVITIES OF U. S. MINING MEN

**Louis E. Hanley**, president and general manager of the Hecla Mining Company, Burke, Idaho, has retired after 11 years service in those jobs and 47 years with the company in various other capacities. He has, however, been re-elected to Hecla's board of directors, as chairman. Other directors re-elected were **J. L. MacCarthy**, **R. W. Neyman**, **A. W. Witherspoon**, **Fred Searls, Jr.**, **George F. Mayer**, and **Seth Pollard**. The Hecla company owns 50 percent of Sullivan Mining Company and controls Polaris Mining Company.

**Howard G. Schoenike** has been made superintendent of the Hanna Development Company's exploration work on Nickel Mountain, Riddle, Douglas County, Oregon.

**Charles L. Wheeler, Jr.** is now works manager for Pacific Northwest Alloys at the Mead, Washington, magnesium plant. He succeeds **W. T. McGinnis** who has become assistant to the president of the Keokuk Iron Works, Iowa.

**Jack C. Pierce**, executive secretary of the New Mexico Miners and Prospectors Association, resigned his post, effective June 30, and is now at Phillipsburg, New Jersey, as assistant editor of the *Compressed Air* magazine. Pierce held the New Mexico post for four and a half years, and among numerous accomplishments of his office was the expansion of the association's official organ, *New Mexico Miner and Prospector*, from a bulletin to a magazine. Pierce worked in 1944 for the Carbide and Carbon Chemical Corporation at Oak Ridge, Tennessee, as physical-chemist and later as chemist-physicist. He held jobs before that with the U.S. Potash Company, the Climax Molybdenum Company, Republic Steel's Susquehanna Ore Company and U.S. Steel's Oliver Iron Mining Company. He is a graduate of the University of Arizona.



**LANCELOT BALDERSON** has been appointed assistant to the vice president in charge of iron ore operations by Oglebay, Norton and Company. He will be stationed in the company's Cleveland, Ohio, offices and will assist Frank J. Smith, vice president, who has offices at Duluth. Balderson has been with the mining department since 1948 working particularly on taconite mining problems, a phase he will continue to specialize in.

**Russel B. Caples** was elected president of the American Zinc Institute at the annual meeting of the board of directors recently held at St. Louis, Missouri. Caples, manager of the Anaconda Copper Mining Company's operations at Great Falls, Montana, succeeds Edward H. Snyder of Combined Metals Reduction Company. Three vice presidents also were elected: **Elmer Isern**, Eagle Picher Mining and Smelting Company; **Herman D.**

**Carus, Matthiessen & Hegeler Zinc Company**; and **G. Howard LeFevre**, U.S. Smelting Refining and Mining Company.

**Erle V. Daveler**, American Zinc, Lead and Smelting Company was reelected treasurer; and **Ernest V. Gent** continues as executive vice president and secretary. Early at the meeting several directors were elected, including: **Caples** and **Daveler**; **Stanly A. Easton**, Bunker Hill & Sullivan Mining & Concentrating Company; **J. M. Bowlby**, Eagle-Picher Company; **R. L. McCann**, New Jersey Zinc Company; **G. W. Potter**, mining operator, Joplin, Missouri; **A. L. Queneau**, U.S. Steel Corporation; **F. A. Wardlaw, Jr.**, International Smelting & Refining Company; **H. I. Young**, American Zinc; and **W. H. Leverett**, National Zinc Company, who was elected to the term ending 1953.

**Charles R. Ince** and **Rene J. Mechin** have been elected vice presidents of the St. Joseph Lead Company, New York. Ince, an engineering graduate of Columbia University and employed by St. Joseph since 1929, was metal sales manager at the time of his promotion. Mechin, a graduate of the Colorado School of Mines and employee of the company since 1925, was division manager of the Balmat-Edwards properties until 1949 when he was transferred to the New York office.

**Dr. Robert E. Wallace**, associate professor of geology at Washington State College, has been given a leave of absence for the summer. He will work with the U.S. Geological Survey at Spokane. He was employed by the Survey for five years before joining the college staff and has worked for the Survey since then each summer.

**Conrad F. Trowbridge**, formerly assistant to the vice president in charge of operations of the Pennsylvania Railroad, is now with Pickands Mather & Company in its general office at Duluth, Minnesota.

**E. L. Bemis**, superintendent of the Canisteo mine at Coleraine, Minnesota, for the Cleveland Cliffs Iron Company, has resigned and has gone to Winter Park, Florida, to live.

**S. B. Coolidge, Jr.**, of Cleveland, Ohio, is now deputy assistant administrator of the Metals and Minerals Bureau, National Production Authority, U.S. Department of Commerce. He is on leave from his job as vice president and director of auxiliaries of the Sherwin-Williams Company.

**Walter S. Tower** was elected president of the American Iron and Steel Institute at the annual meeting of the board recently. Elected as vice presidents were **Benjamin F. Fairless**, president of the U.S. Steel Corporation, and **Frank Purnell**, chairman of the board of the Youngstown Sheet and Tube Company. **Max D. Howell** was elected treasurer. He is vice president and treasurer of U.S. Steel and succeeded **Harold L. Hughes**, resigned, in the AISI position. **Charles R. Tyson**, president of John A. Roebling's Sons Company, and **R. K. Clifford**, president of Continental Steel Company, were elected to the board of directors of the Institute.

**William F. Betzler** has succeeded **Julius Strande** as engineer at the Longyear mine of the Inter-State Iron Company. Strande has transferred to the company's general office at Virginia, Minnesota.



**GEORGE W. WUNDER**, left, plant manager of National Lead Company's MacIntyre Development in New York since 1949, has been appointed plant manager of the U.S. Atomic Energy Commission's Feed Materials Production Center to be constructed near Cincinnati, Ohio. **DAVID J. BLYYTHE**, right, general superintendent of National Lead's Perth Amboy, New Jersey plant since 1948, has been made production superintendent of the AEC's Center. The National Lead Company is contract-operator of the plant, which will include a uranium ore refinery and other facilities for the production of uranium in forms suitable for use at the Commission's fissionable materials production plants.

**H. M. Riddle** of the Asbury Graphite Mills, Inc., Asbury, New Jersey, was one of several members at the recent meeting of the Natural Graphite Importers-Processors Industry Advisory Committee with the National Production Authority. Others at the meeting included **W. V. H. Moore** of Cummings-Moore Graphite Company, Detroit; **W. S. Joyce**, Superior Flake Graphite Company, Chicago; and **Smith Bolton**, U.S. Graphite Company, Saginaw. **Harry B. Sharpe**, director of NPA's Miscellaneous Metals and Minerals Division, presided at the meeting.

**R. T. Elstad**, president of the Oliver Iron Mining Company, received one of the University of Minnesota outstanding achievement awards at ceremonies held at the Minneapolis campus May 25.

**John Evans** of Phoenix, Arizona, has been elected president of the Comstock Extension Mining Company, which is developing zinc-copper claims between Globe and Miami.

**James B. Hustad**, formerly with Oliver Iron Mining Company's mining engineering department at Duluth, Minnesota, has resigned to operate an iron ore property in Puerto Rico, West Indies (see Latin American section, this issue).

**Norman P. Proehl** has been made superintendent of the Livengood Placers, Inc., gold dredging firm, near Fairbanks, Alaska. He had been with the United States Smelting Refining and Mining Company's Fairbanks operations.

**William Huff Wagner**, consulting mining engineer and geologist of Washington, D.C., is on a several-month inspection tour of southwest mining districts.

**Thomas G. Simison** has been appointed division superintendent of rolling mills

for Kaiser Steel Corporation, Fontana, California, in the tin-plate and flat-rolled departments. **Robert C. Madden** is division superintendent for all rolling mill operations. Other appointments in the tin-plate section were **William Keirn** and **Dale Miller**, assistant superintendents; **Roger Barnes**, general foreman; and **Reynold C. McDonald**, assistant superintendent of the merchant mill. **Joseph Lencioni** was made assistant superintendent of cold rolling succeeding Dale Miller.



**FELIX E. WORMSER** was re-elected president of the Lead Industries Association at the 23rd Annual Meeting held in New York in May. Re-elected as vice presi-

dents were **J. A. Martino**, president of the National Lead Company, and **K. C. Brownell**, president of the American Smelting & Refining Company. **R. L. Ziegfeld** was reappointed secretary-treasurer. The board of directors includes **Wormser**, **Martino**; **Brownell**; **S. A. Easton**, president of **Bunker Hill & Sullivan Mining and Concentrating Company**; **H. L. Day**, president of **Day Mines, Inc.**; **O. N. Friendly**, vice president of **Park Utah Consolidated Mines Company**; **James Ivers**, vice president of **Silver King Coalition Mines Company**; and **George Mixer**, vice president of **United States Smelting Refining & Mining Company**.

**H. F. Haller** has resigned as assistant mining captain at the Sunday Lake mine, **Pickands Mather and Company**, to become superintendent of the Southern Alkali Corporation limestone mine at **Barberton, Ohio**.

**Stanley M. Walker** is now in Washington, D.C., with the Requirements Division of **DMA**. He is a graduate of the Colorado School of Mines and has had many years of operating and consulting experience in the west and the south. He moved to Washington from **Birmingham, Alabama**.

**Philip R. Bradley, Jr.**, chief of the tungsten-chrome-manganese division of the **DMA** resigned on June 17th to return to **San Francisco**. He is president of the **Pacific Mining Company** and was in Washington for a temporary assignment of six months assisting in establishing the tungsten ore-buying program, the **Grants Pass, Oregon**, chrome purchase depot and the proposed **El Paso, Texas**, custom manganese ore mill.

**Whitman W. Hopton** of the Tin, Lead and Zinc Division of the National Production Authority, presided at a recent meeting of the Cadmium Industry Advisory Committee which discussed the relaxation of rules allocating cadmium, now on hand in sufficient amounts for wider use. Among men attending the meeting were **Sherman N. Goble** and **L. G. Matthews** of the American Smelting and Refining Company; **Clarence Glass**, **Anaconda Sales Company**; **Kurt Weinberg**, **National Zinc Company**; **Charles R. Ince**, **St. Joseph Lead Company**; and **Howard LeFevre**, **United States Smelting Refining and Mining Company**.

**David B. Cavan**, superintendent of the Sunday Lake mine at **Wakefield, Michigan**, of **Pickands Mather and Company**, retired after 43 years of service. **Rodney D. Hodge**, who had been captain of the **Newport mine** at **Ironwood**, succeeded **Cavan**. **Lawrence G. Woodworth** succeeded **Hodge** at the **Newport**.

**Parke A. Hodges**, vice president of **Behre Dolbear & Company**, **New York**, has been on a professional mission in **Turkey**; and **Dr. A. F. Banfield** has been making examinations in **Wyoming** and **California**.

**J. B. Mitchell**, vice president of operations, **Jones & Laughlin Steel Corporation**, has announced the appointment of **W. P. Getty** as his assistant. Succeeding **Getty** as assistant general manager of raw materials is **C. M. Lichy**; and **C. E. Amos** has been appointed to the position of assistant to the general manager of raw materials.

**C. Wilbur Miller** and **Philip L. Poe** of **Baltimore, Maryland**, have been elected directors of the **Jefferson Lake Sulphur Company, New Orleans, Louisiana**.

**John M. White** has been made a partner in **Hopkins, Harbach & Company**, brokerage firm of **Los Angeles, California**, which deals extensively with gold mining companies in the **Philippines**.



**WILLIAM WALLACE MEIN, JR.**, has been elected president of the **Calaveras Cement Company, San Francisco, California**. He had been vice president and assistant to the president and succeeds his father, **William Wallace Mein**, who has been made

chairman of the board, a newly created position. **H. C. Maginn**, vice president and chairman of the management committee, has been elected executive vice president, and **A. A. Hoffman**, consulting engineer, has become vice president.

**Charles H. Dunning** has opened a consulting mining engineering office at **1633 W. Earll Drive, Phoenix, Arizona**. He is a former director of the **Arizona Department of Mineral Resources** and has had a long career in mine operation and management in the southwest.

**Nelson W. Aldrich**, director of public relations for the **Utah Copper Division** of the **Kennecott Copper Corporation**, **Salt Lake City**, has been appointed state chairman of the **National Organization and Community Activities Committee** of the **U.S. Defense Bonds Division, U.S. Treasury Department**.

**Robert Sayre, Jr.** has resigned as superintendent of the **Old Hundred Gold Mining Company, Silverton, Colorado**, and is now scouting for uranium properties on the **Colorado Plateau** for the **U.S. Atomic Energy Commission**. He is establishing residence at **Grand Junction, Colorado**.

**Roland Erickson** has joined the engineering department of the **Reserve Mining Company** at **Babbitt, Minnesota**, on the **Mesabi Range**.

**William J. Hasler** left **Bunker Hill & Sullivan Mining and Concentrating Company, Kellogg, Idaho**, to accept a position as geologist with the **U.S. Geological Survey** at **Salt Lake City, Utah**.

**Victor Lager** of **Nashwauk, Minnesota**, has been promoted from foreman to district master mechanic for **The M. A. Hanna Company, Cooley district**.

**George Miscovich** and his brothers, **Howard** and **Andy**, have returned to the **Poorman and Flat, Alaska** region for the mining season.

**Russell Le Doux** has been appointed chief engineer for the **Hill-Annex iron mine, Inter-State Iron Company, Calumet, Minnesota**.

**Joseph H. Reid** has been elected a vice president of the **National Lead Company**. He has been with the company since **1927** and early last year had been made a director and member of the executive committee. He has also held the position of manager of the **Titanium Division** since **1949** and is a director of the **Titanium Pigment Corporation**.

**Dr. Gurdon Montague Butler, 70**, is retiring as dean of the **College of Engineering, University of Arizona, Tucson**. He will continue in service on a part-time basis. **Dr. Butler** graduated from the **Colorado School of Mines** in **1902** and received his doctorate of science from the **School** in **1922**. He joined the **University of Arizona** in **1915** as professor of mining engineering and dean of the college of mines and engineering. He is a member of numerous societies and has been prominent in state work along engineering lines.

**Stanley R. Miller, William H. Mitchell** and **George A. Spiva** have been elected directors of the **Eagle-Picher Mining and Smelting Company** at **Miami, Oklahoma**.

**H. Gordon Poole**, mining and metallurgical engineer, has moved to **Albany, Oregon**, where he is now chief, **Nonferrous Metals Branch, U.S. Department of the Interior, U.S. Bureau of Mines**. He had been associate professor of mineral engineering at the **University of Washington, Seattle**.

**Irving C. Roberts**, mining engineer, formerly with the **Bunker Hill & Sullivan Mining Company, Kellogg, Idaho**, has resigned and has been appointed engineer with the industrial hygiene section of the **Idaho State Public Health Department**. He replaces **Howard C. Burkhardt**, now on active duty with the air force.

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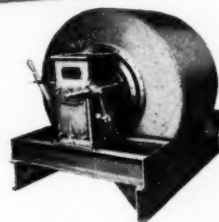
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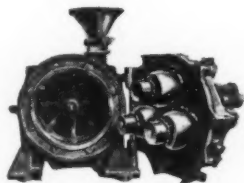
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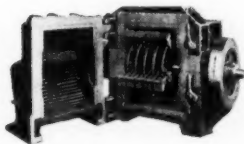
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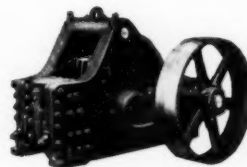
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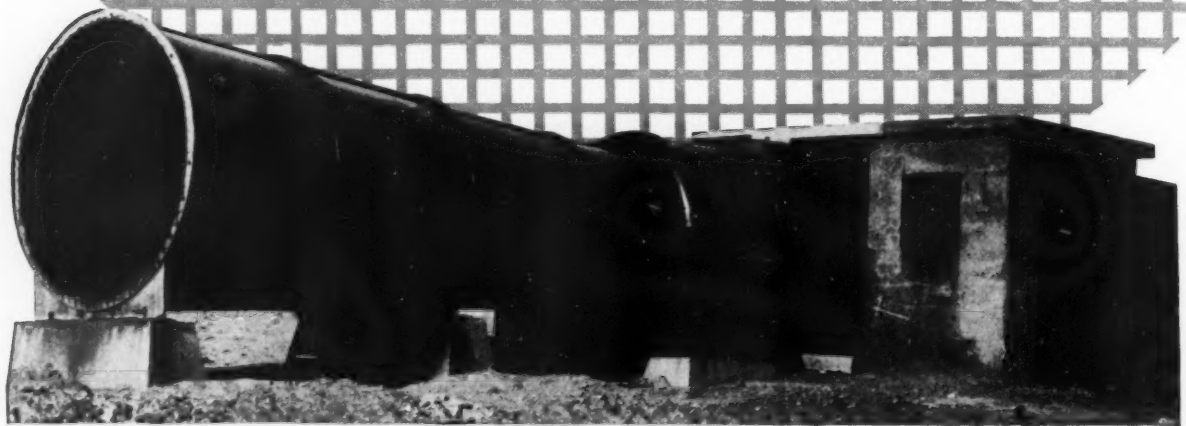
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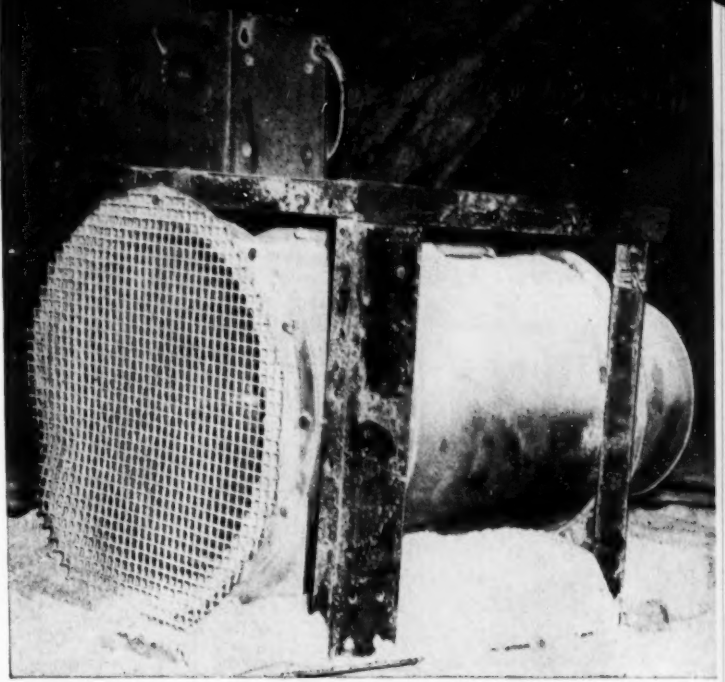
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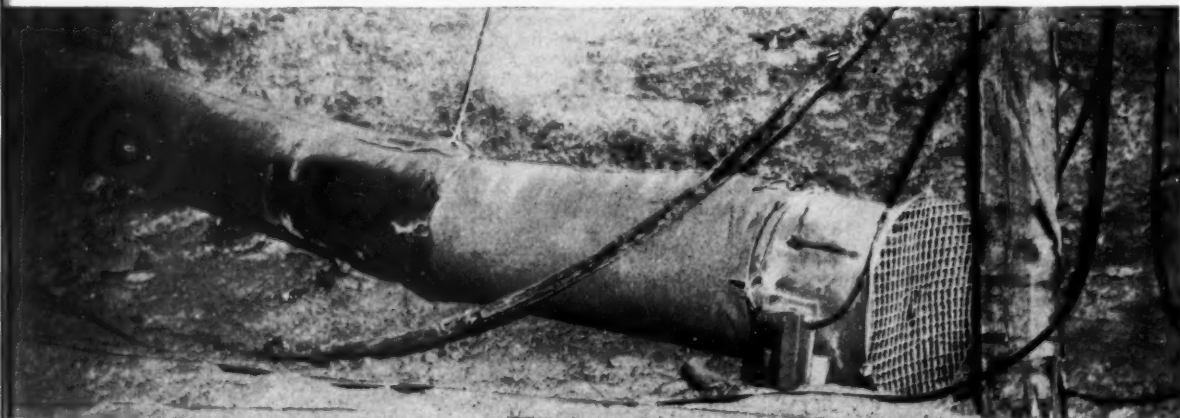
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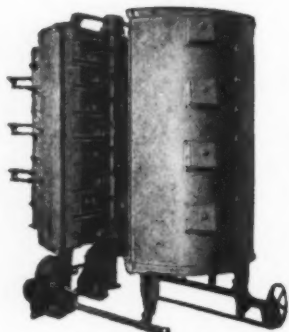
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FULLERS EARTH	MAGNESIUM
CARBON	CLAY
PYRITE	ANTIMONY

SELENIUM  
SEWAGE SLUDGE  
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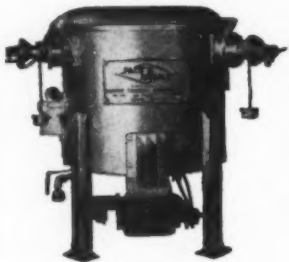
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K. K. Dar  
Mining Geologist  
Udaipur  
Rajasthan, India.

## Abstracted by Chemisches Zentralblatt

Dear Sir:

We thank you very much for the delivery of Volume 3, No. 12 (1950) of WORLD MINING.

We have the pleasure to abstract in our Chemisches Zentralblatt the original publications contained therein.

Awaiting your further issues we are very obliged to you.

Chemisches Zentralblatt  
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Germany.

## Atomic Geologist Will Receive WORLD MINING

Dear Sir:

I am glad to inform you that WORLD MINING has been giving me informative news and has been keeping me in touch with the activities of the mining world. I shall be obliged if you will kindly continue sending it.

In this connection I would like to inform you that recently Mr. K. L. Bhole, Mining Geologist, Atomic Energy Commission (India) has been posted at Ajmer. So far he has not received a copy of WORLD MINING but has been looking at my copies. Would it be possible for you to kindly send him a copy direct?

B. Bharagava,  
Mining Engineer and Geologist,  
Ajmer, India.

## Constant Reader

Dear Sir:

As a constant reader of WORLD MINING for a good many issues I have found it an invaluable source of information on the latest developments in mining methods.

The magazine performs a splendid service for all of us who are interested in mines.

Francisco Cuevas Mackenna,  
Casilla 3966,  
Santiago, Chile.

## Placer Jig Data for Tin Producer

Dear Sir:

In the issue of WORLD MINING, November, 1950, under New Methods-New Equipment, there is an item dealing with:

Placer Jigs; Doraco Bulletin 2401.

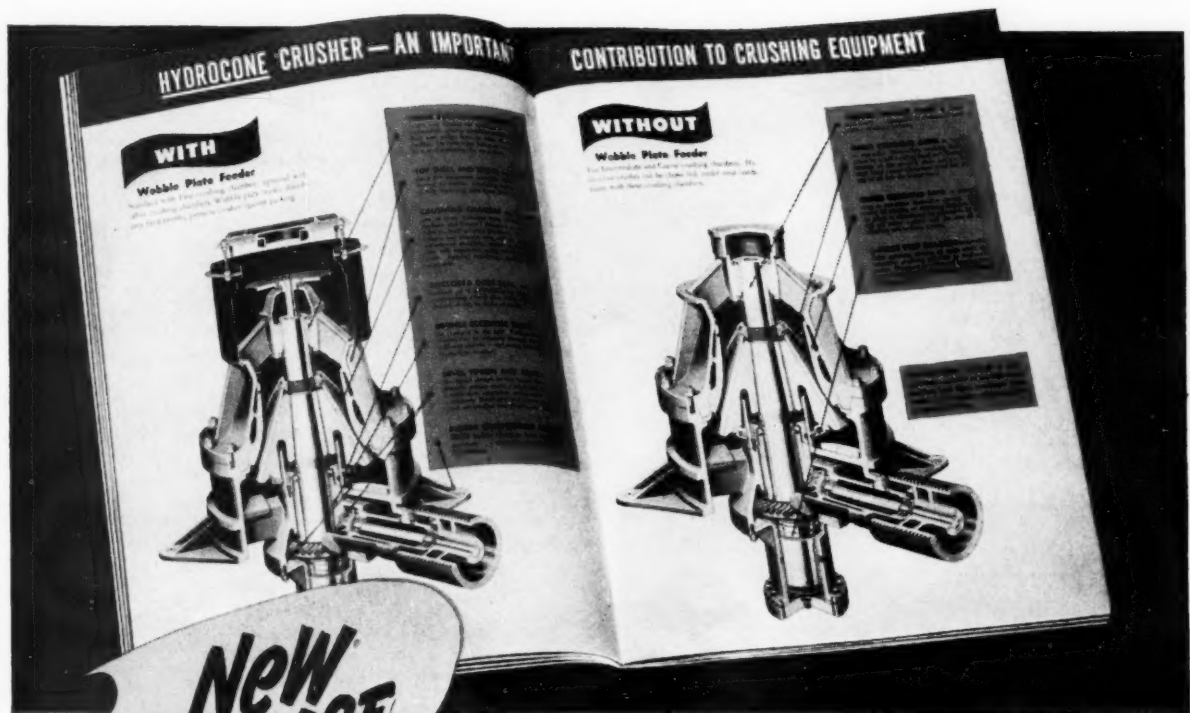
We are interested in this equipment and would like further particulars about these machines.

Have they manufacturers agents in this country, if so where can they be contacted, and do they carry stocks of these jigs?

We are opening up a placer tin deposit, and find that the old method of sluice boxes is both uneconomic and wasteful, the Pan American Jig used for the same purpose has been repeatedly mentioned in past issues of your journal, where it is stated that this machine gives every satisfaction both as regards separation and recovery.

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# WORLD MINING

The International Department of MINING WORLD

## INTERNATIONAL PANORAMA

**CARLSBAD**—The mine and mill of the Potash Company of America has operated 10,000,000 man-hours without a fatal accident. More than 8,500,000 pounds of powder was shot during the time.

**WASHINGTON**—The State Department has announced that duties on lead, chromium, vanadium, aluminum, and zinc have been cut. The reduced lead and zinc duties were effective on June 6th.

**NEW YORK**—Electro-Metallurgical Division of The Union Carbide and Carbon Corporation is spending \$135,000,000 to increase its ferro-alloy capacity 200 percent over the 1940 capacity. Nine company plants are being enlarged or improved under the program.

**ROME**—The Italian Chamber of Deputies has approved a 10,000,000,000-lira program for exploration and development of Sicily's sulphur industry.

**MINDEN, NEVADA**—The first government contract for sharing mine development costs as provided under the Defense Production Act of 1950 has been signed. David G. Wood, an independent tungsten producer, is to receive \$4,650 in federal assistance funds.

**LONGVIEW, TEXAS**—The R. G. Le Tourneau Company will build a two-electric-furnace steel plant and rolling mill to produce 1,000 tons per month of 144-inch-wide steel plate.

**MOUNTAIN IRON, MICHIGAN**—The Oliver Iron Mining Company has started construction of a pilot taconite beneficiation plant. The plant is scheduled for operation in mid-1952. Concentrate output will be 500,000 tons per year.

**INDIANA HARBOR, INDIANA**—The S. S. Wilfred Sykes, largest Great Lakes ore carrier in the world, has broken its own record and transported 20,084 gross tons of iron ore at one time to blast furnaces here.

**TORONTO**—Barvue Mines has made one of the largest zinc concentrate sales in history—175,000 short dry tons of concentrate at a price of 17.5 cents per pound of contained zinc. The zinc will be used by the American Steel & Wire Company.

**MONROVIA**—The first ship load of iron ore from the Liberia Mining Company, Limited's Bomi Hills iron ore mine has been made. The cargo was consigned to Republic Steel Company in the U. S., Liberia Mining's parent company.

**PARIS**—The Societe Miniere Intercoloniale has signed a contract with ECA in the amount of \$1,300,000 for diamond exploration in eastern Oubangui, French Equatorial Africa.

**LONDON**—Proposed development of Mufulira Copper Mines' Chibuluma copper-cobalt prospect and increased copper production at its mines in Northern Rhodesia are under discussion. ECA funds totalling \$8,000,000 would be used.

**WASHINGTON**—An export quota for molybdenum in the amount of 1,250,000 pounds has been licensed for the second quarter of 1951. It is to be distributed primarily among the steel producers of western Europe.

**LONDON**—The tungsten price has risen during the last month and wolframite is quoted at \$10.00 per unit above the United States ceiling price.

**NEW YORK**—Imports of copper in all forms for the first quarter were at an annual rate of 255,000 short tons compared to 330,855 tons for 1950.

**WASHINGTON**—The Defense Mobilization Director has announced that domestic supplies of copper, sulphur and zinc may be allocated to consumers outside the United States.

**BUFFALO**—The first shipment, 10,000 tons, of Swedish iron ore has been received by the Bethlehem Steel Company. More shipments are scheduled.

**WASHINGTON**—The copper excise tax has been suspended until February 15, 1953, or until the end of the present national emergency whichever is earlier. If the domestic price of copper drops below 24.0 cents per pound the tax will be reimposed.

**ROME**—Torbernite mineralization has been found between Lake Como and the Italian-Switzerland frontier. The Societa Italiana del 'Uranio may explore the area.

**JOHANNESBURG**—Central Holdings and Exploration Co. Ltd. has been formed to acquire vermiculite mining leases in the Zoutpansberg district, Transvaal.

**WASHINGTON**—Mercury consumption in the United States in the first quarter of 1951 was at a new peak annual rate which greatly exceeded the highest World War II consumption rate.

**OSLO**—The Norwegian Parliament has been asked to approve an additional State guarantee of 35,000,000 Kroner to Sydvaranger, Inc. to complete reconstruction of the firm's iron ore mines and mills. The cost increase is due to expansion of concentrate capacity to 1,000,000 tons per year.

**SANTIAGO**—The Chile Copper Company has raised the price of its copper to 27.50 cents per pound. The rise in price is a result of the agreement between the United States' State Department and the Chilean government whereby Chile receives an additional 3 cents per pound for its copper sold in the United States.

**OTTAWA**—Controls over the use of aluminum and copper have been established by the Department of Defense.

**TOKYO**—The Economic Stabilization Board has drafted plans for production of steel ingots in 1951 amounting to 6,090,000 tons and 85,000 tons of electrolytic copper.

**WASHINGTON**—The Secretary of the Interior has recommended increased aluminum production of 188,000 tons per year. This is in addition to the 450,000 ton increase certified in December 1950.

## Peruvian Gold Mines Stamping Own "Coins"

The Peruvian Congress recently approved a Supreme Decree permitting Peruvian gold mining companies to stamp their gold output in the National mint in coin-like disks of 900 fineness. Three disks have been authorized with a gold content in fine grains of 8.42528, 21.0632 and 42.1264 respectively. The prices at which the banks are selling the disks to the public are 200.0, 500.0 and 1,000.0 Soles Oro, respectively. For the largest disk the Soles value is  $1,000.00 \div 42.1264 = 23.73808$  S/O per gram. The rate of exchange is 15.00 Soles to \$1.00. Then  $23.738 \text{ grams} \div 15.00 \text{ Soles} = 1.58254$  Soles per gram. And  $1.58254 \times 3.1$  (grams per Troy ounce) =  $49.216994 = \$49.216994$  per Troy ounce. Or  $49.216994 \div 35.00 = 140.62$  percent of the official price of the United States government, the International Bank and the International Monetary Fund.

The Peruvian gold miner is now able to receive a price for his product more in accord with the increasing costs of production. The miner can sell the disks, each bearing the Coat of Arms of Peru and the weight and fineness, at any price he desires. The demand for the disks is much greater than the supply and has cut down on the smuggling of gold out of Peru.

## New Railroads and Ships To Move Labrador Ore

More than 2,000 men and more than \$8,000,000 worth of construction equipment are now involved in the construction of the 385-mile-long standard-gauge, railroad line from Seven Islands, Quebec, to the Knob Lake, Labrador-Quebec iron ore deposits.

The railroad is being built for the Iron Ore Company of Canada's subsidiary, Quebec North Shore and Labrador Railway, by a group of United States and Canadian contractors including Morrison-Knudsen Company, Mannix Inc., and Cartier and McNamara. During the past winter the 2,250-foot-long Moisie River tunnel was completed. The railroad is scheduled to be in operation in 1954.

Indicated ore reserves in the Knob Lake area have been increased by drilling to 281,000,000 tons on the North Shore Exploration Company's holdings and 136,000,000 tons on those of the Labrador Mining and Exploration Company.

Meanwhile a new company has been formed to build and operate two new 30,000-ton-capacity ocean-going ore carriers which will transport the ore from Seven Islands to Montreal, Quebec; to Philadelphia, Pennsylvania; and to Baltimore, Maryland. The ships are to be built in England with delivery scheduled for the fall of 1955. The new shipping company was formed by the Armo Steel Corporation, Hanna Coal & Ore Company, National Steel Corporation, Wheeling Steel Corporation and the Youngstown Sheet and Tube Company, all of whom are stockholders in the Iron Ore Company of Canada.



The Harding mine. Looking south over the top of the quarry. The upper edge of white pegmatite contrasts with overlying dark amphibolite. The V-shaped cut in top of pegmatite (right of center) marks the entrance to the beryl tunnel and underlies the old beryl cut.

## THE HARDING PEGMATITE--REMARKABLE STOREHOUSE OF MASSIVE WHITE BERYL

**Production from this one deposit was large enough to make New Mexico the nation's largest beryl producing state in 1950**

**When three men can and do produce several hundred tons of beryl per year, they are conducting a unique mining operation at a remarkable pegmatite. This article, by the man responsible for the operations, describes one of the world's most unusual beryl mines.—Ed.**

The Harding mine is in Taos County, north-central New Mexico, midway between Santa Fe and Taos. The mine lies eight miles east of the village of Dixon, and is reached by means of State Highway 75. The location is in mountainous country at the western edge of the lofty Sangre de Cristo Range.

The mine, a pegmatite deposit, was discovered 30 or 40 years ago by a local prospector, Joe Peyer. On the surface were great, loose blocks of lilac-colored lepidolite, a lithium-bearing mica. Eastern interests worked the deposit extensively during the 1920's and shipped many thousands of tons of lepidolite for use in the glass industry. During this mining a large quarry was opened up in the hillside, exposing the pegmatite as a nearly flat-lying lense hundreds of feet in lateral dimensions and more than 50 feet thick. Then the whole mass dips gently westward, and diamond drilling has explored the down-dip, sub-surface extension for 1,000 feet. The

**By Arthur Montgomery**

**Owner and Operator, Harding Mine  
Dixon, New Mexico**

upper edge of the pegmatite stands out sharply as an irregular line of white rock cutting horizontally across the overlying, dark-colored amphibolites. The pegmatite, a huge dike of coarsely crystallized feldspar and quartz, has intruded the steeply dipping beds of schistose amphibolites. Splotches of pink in the walls of white rock rising sheer above the quarry floor represent masses of lepidolite.

After the early lepidolite mining the mine lay idle until 1942, when the writer examined the deposit and found rich showings of microlite-bearing lepidolite. Microlite, a mineral of high tantalum content, occurs at the Harding mine as tiny yellow or brown grains in lepidolite. During World War II the mine was leased and operated for microlite, and became the only important domestic source of tantalum.

### **Early Beryl Work**

Prior to 1942 the mineral, beryl, had almost escaped notice at the Harding mine. Dr. R. H. Jahns of the U. S. Geological Survey first called the writer's attention to it. If one were not looking for beryl, it was easy to miss. A little bit of

caesium in its make-up has given all of the Harding beryl a white color, and its general appearance is similar to quartz or potash feldspar. It does not occur in distinct crystals, except very occasionally. Actually however, beryl is not uncommon in the uppermost and lowermost wall-zone layers which form a rind two feet thick around much of the flat-lying dike. Fist-sized spots of white or palest-pink beryl are scattered through parts of the upper wall-zone layer like plums in a pudding.

While exploring one of the old mine dumps in 1944 a large block of milky quartz was found. But the mass had a fine-textured and homogeneous appearance unlike quartz. There was a distinctly resinous luster also, and no signs of the well-developed conchoidal fractures one might expect to find in quartz. The mass was not quartz; it was a block of pure beryl weighing nearly 100 pounds. Large beryl masses had never been seen at the Harding mine. After four tons of beryl had been dug out of one small area in this dump, the size and purity of many of the masses suggested a common source in a likely single concentration of mammoth proportions.

At the western end of the quarry a wall of white pegmatite went straight up for 20 feet. Above the pegmatite was a steeply sloping face



of dark amphibolite 15 feet thick. The upper edge of pegmatite was prospected across this wall by means of ropes and rock-climbing techniques. Many small spots of beryl were noted in the uppermost two feet of pegmatite. At one high place along the pegmatite-amphibolite contact there was a small knob of beryl, perhaps eight inches in diameter, projecting upward into the amphibolite; this area seemed worthy of investigation.

A small platform was cut back into the quarry wall around the beryl knob by blasting out the overlying amphibolite. The floor of this small cut consisted of the upward-bulging top surface of the pegmatite with its knob of beryl at the outer edge. Several holes were drilled downward at the side of the cut and inclined beneath central part of the pegmatite floor; after these holes had been lightly loaded and blasted, some large, blocky masses of white rock were broken out of the floor and covered the bottom of the cut. These proved to be blocks of nearly pure beryl. A solid layer of white beryl, a foot thick and several feet across, now lay exposed in the pegmatite floor at the back of the cut. As mining continued, this layer of beryl extended back into the hillside and along the top of the pegmatite for nearly 20 feet. The layer proved to be lens-shaped, with a maximum thickness of three feet and width of five or six feet. After 20 feet of mining the lens pinched down abruptly in all directions and finally disappeared. A cut 25 feet square now had been dug out of the quarry wall, and at the back of the cut, due to the upward slope of the hill above and the slight westward dip of the pegmatite, an overhanging wall of amphibolite towered 25 feet high. The soft, schistose amphibolite was extremely dangerous rock to be under, and after the beryl had pinched out at the back of the cut further mining proved infeasible. But several weeks of work in the cut had produced 23 tons of beryl. Very little cobbing was necessary. Some masses weighed up to 500 pounds.

In April, 1944, 27.5 tons of beryl was shipped to Metals Reserve Company from the Harding mine. Chemical analysis gave the BeO content as 10.94 percent. Pure Harding beryl of this type carried 12.5 percent BeO.

#### Later Beryl Work

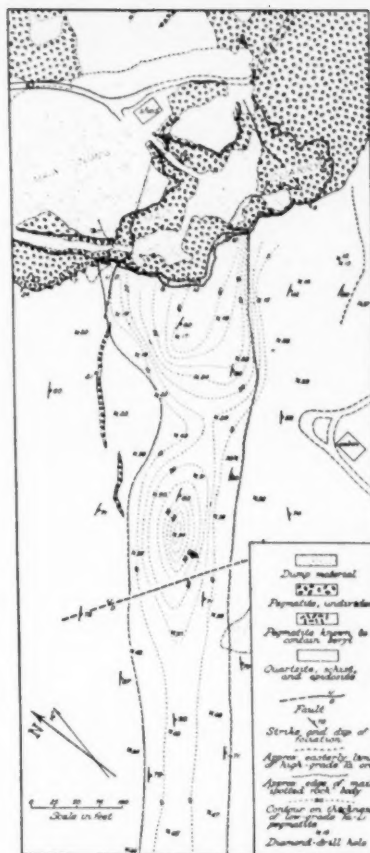
Of the 39 diamond-drill holes drilled downward through the Hard-

ing pegmatite in 1943, one hole alone was reported to have encountered beryl in quantity. On the drill logs Hole 22 shows a thickness of five feet of nearly pure beryl at the top of the pegmatite. This hole is about 140 feet west of the beryl cut (see accompanying maps). Even with a guarantee of such a thickness of beryl around Hole 22, driving a tunnel 140 feet to that hole from the top of the quarry would have been unjustifiable; the current beryl price failed to offer adequate return, and mining beneath soft and slabby amphibolite was an uninviting prospect. Actually, there was no guarantee of more than a small part of that much beryl, for there had been considerable core loss in Hole 22.

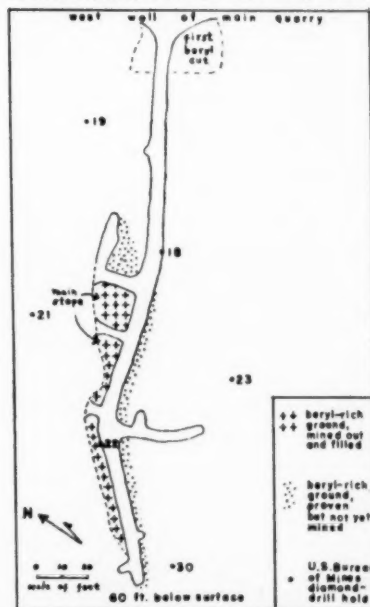
No further beryl mining was attempted at the Harding mine until the summer of 1949, when several small concentrations of beryl near the top of the pegmatite and at the northeastern end of the quarry were discovered. Four tons of beryl were produced from these showings. If the three beryl occurrences, the eastern, that of the beryl cut, and the showing in Hole 22, were now plotted on a map, the three would lie on a fairly straight line. The conviction grew that some sort of a zone of beryl enrichment lay along this line.

In 1949 atomic energy and other applications finally forced the beryl price high enough to encourage small-scale domestic mining for the first time in history. At the end of that summer the foreman of the Harding tantalum operation, Flaudio Griego of Dixon, expressed a wish to return to pegmatite mining. A beryl-mining partnership was proposed to Griego, and accepted. To most people the planned operation seemed a pure gamble, also a difficult and expensive venture. It did not seem such a gamble to the writer, who had faith in his hypothetical zone of beryl enrichment, nor to Griego, who felt sure of his ability to drive a tunnel through dangerous ground with safety, speed and minimum expense.

With one helper, Griego started the tunnel in early fall of 1949, while I was in the east. For a month only traces of beryl were encountered. As the tunnel was driven westward the top of the pegmatite was kept several feet above the floor. Since the pegmatite dips gently westward, the tunnel had to be run on a slight incline. After 60 or 70 feet of progress, several "large spots" of beryl were found. Then late in December



Geologic map of a part of the Harding mine area showing distribution of U.S. Bureau of Mines diamond-drill holes. The beryl tunnel intersects drill holes 18 and 22 and starts from the wall at the west end of the main quarry. (Map by R. H. Johns, from MINING ENGINEERING, Jan., 1951, p. 51; MINING TRANSACTIONS, A.I.M.E., Vol. 190, 1951.)



Plan of beryl tunnel (April 1, 1951). See geologic map for location of tunnel with respect to drill holes and main quarry.



Fludio Griego and 30 tons of beryl.

a sudden change occurred. The top of the pegmatite began to rise out of the floor in the tunnel face and along the right-hand, or north wall. After 10 feet more, solid pegmatite stretched all the way from the tunnel floor to the back.

Soon after January, 1950, the spots of beryl in the north wall of the tunnel were getting "larger." Then reports came in rapid succession. No further "spots" were mentioned; the beryl now was described as a "layer." There was apparently a continuous layer of beryl at the top of the pegmatite along the north wall and in the tunnel face. This layer grew in thickness with each report. Finally there came the report: "Solid layer of beryl eight feet thick all the way from the tunnel back down into the floor on the right-hand side." The small daily production of clean, sorted ore now went up to staggering proportions. An exploratory drift was then run northward to see how far the beryl continued into the right-hand wall. The report came back that for 12 feet this drift followed a continuous layer of beryl at the top of the pegmatite average three feet in thickness. But after 12 feet the whole pegmatite, which had stood eight feet above the floor of the drift, suddenly dropped off vertically against amphibolite. That was the end of the beryl so far as northward direction was concerned.

At one time during this period production reports showed that 25 tons of sorted beryl had been produced between January 11th and February 3rd, or an average of 1.5 tons of beryl every day for 17 consecutive working days.

In February the writer flew out to New Mexico for a look. A small

mountain of white rock stood in front of Griego's house in Dixon, almost hiding it from view. This was a pile of 50 tons of beryl. Not a piece of quartz or feldspar could be detected in the pile; it was an almost perfect job of sorting. In the tunnel there was an equally impressive sight. Commencing from the 12-foot drift and working westward from there along the north side of the tunnel, Griego had stoped out an area 25 feet long by 12 feet wide. The entire top of this once pegmatite-filled area had been a continuous layer of beryl two to three feet in thickness. Farther west the main tunnel was being pushed ahead with a beryl layer two feet thick exposed in its face, but the pegmatite had dropped from a height of eight feet above the floor to only three feet and the stoping width of rich ore had narrowed down from 18 to 10 feet.

But the real sight was the exposure still remaining along the eastern side of the stope. For 12 feet from north to south there was a wall of pegmatite eight feet high, cut off the south by the tunnel and on the north dropping off vertically against amphibolite almost to the floor. The whole top of this pegmatite wall was a mass of white beryl, never less than two feet in thickness and reaching nearly to the floor in two places. If one were measuring beryl thickness vertically, it was seven or eight feet thick in these two places; in reality these were vertically disposed layers, several feet thick laterally. A third such layer had been cut off by the tunnel, and had constituted Griego's "solid layer of beryl eight feet thick." Coarse masses of gray quartz and blocky albitized microcline lay

against the beryl, and patches of gray muscovite in large flakes and platy crystals of bluish apatite stood out prominently. Patches and veinlets of smoky quartz and pink lepidolite were present also, as were a few spots of copper and bismuth mineralization. Much of the beryl showed great smooth surfaces, the mineral breaking off from these in slabs and platy masses; these were not crystal faces, but a remarkable manifestation of the basal cleavage of beryl which normally cannot even be detected.

From that time on Griego has continued to mine beryl at the Harding mine. The main tunnel has been extended a length of 200 feet. Small-scale stoping has been carried out along its northern side; and here and there along its southern. Drill Hole 22 was finally intersected, and there was a thickness of 22 inches of beryl around it. An exploratory drift, driven southward for 30 feet from the vicinity of Hole 22, went through rich beryl ground for about six feet, and then into almost barren pegmatite. Further exploration north of the tunnel is planned. Some large spots of beryl still appear at the top of the pegmatite in the present tunnel face, but the great, solid layer of pure mineral has disappeared and the pegmatite itself is sinking rapidly into the floor and plunging westward at an increasingly steep angle. The main zone of concentration, associated with a tremendous upward bulge of the pegmatite and topping the bulge like the frosting on a cake, has been left far behind.

#### **Mining Methods**

Usually the tunnel or stope back is kept several feet above the top of the pegmatite. Holes five feet deep are drilled horizontally into the amphibolite above the pegmatite. After shooting, the soft, slabby amphibolite is largely pulverized and may be mucked out easily. This leaves a clean opening five feet deep near the tunnel back, and above the pegmatite. Several lifter holes are then drilled into the pegmatite just below the top beryl-bearing layer. When there is a solid layer of beryl in the face, careful shooting of lightly loaded holes breaks out fairly clean, large masses of almost pure beryl. When the beryl occurs in spots, all beryl-bearing rock is roughly clobbered inside the tunnel with double-jacks before removal to platforms outside for further sorting.

Three grades of beryl come out of the tunnel in a sturdy light-weight



Loading low-grade beryl ore into a truck. Tarpaulins in the background cover piles of high-grade beryl.

ore car with rubber tires which dumps to the side and is drawn by a mule named Beryl. Perhaps 80 percent of the ore is 80 percent beryl. It is dumped down a wooden chute upon a platform 15 feet below, raised five feet above the quarry floor. Here the beryl is further cobbled, brought up to a 90 percent grade, and stacked into a square pile. When 25 tons are in the pile, a dump truck of eight-ton capacity is backed up to the platform for loading.

The remaining 20 percent of ore is either of very coarse size or largely fines. The coarse material goes down a second chute to another platform to await further cobbing to bring it up to a 50 percent grade. The fines, representing all uncob- bable material coming from beryl-bearing pegmatite, are dumped into a separate dump adjoining the chutes. Later on these fines are shoveled upon a platform and moved and sorted twice before loading into a truck. These two types of ore carry about 50 percent beryl, or six percent BeO, and sell at a fair price.

### Conclusions

The example of the beryl occurrence at the Harding mine, in its quantity, color, odd cleavage, and general resemblance to quartz or white feldspar, can do more harm than good if it encourages the belief that almost anything white and massive in pegmatite might be beryl. Beryl cannot be quartz, neither can it be feldspar; it is the distinctive mineral it has always been, regardless of any superficial resemblance to other minerals. White, massive beryl can be recognized by any person who cares to learn some mineralogy, read some pertinent literature about pegmatites<sup>1</sup> and observe different kinds of pegmatite deposits

in the field. To go out searching for beryl deposits without knowing much about the mineral, beryl, or about pegmatites, will prove as fruitless as searching for uranium deposits with dependence upon a Geiger counter rather than upon knowledge of uranium minerals and their geological occurrence.

That more than 300 tons of beryl can be found concentrated together in one rather small area of the Harding pegmatite is a fact surely amazing in itself. But the whole deposit is unique in other respects, and contains equally impressive concentrations of tantalum and lithium minerals. The whole pegmatite, one of immense size, is full of such minerals; if the pegmatite had been exposed almost anywhere along its whole half-mile length, there would have been abundant signs of them. That is the sort of pegmatite to look for when prospecting for large concentrations of rare-element minerals such as beryl; look for a large pegmatite, and one with abundant

evidences of rare-element mineralization.

Also true is that the success of the operation has been due to many other factors other than the primary fact of an immense concentration of beryl within a small area. The information supplied by U.S.B.M. drill Hole 22 has been one of the most important. The mining ability of Griego, as well as of the two men who assist him, the marvelous job of sorting he has done, and his success in keeping production costs at a minimum, have been the most important factors of all. Additional factors have been a thorough knowledge of the geology and mineralogy of the pegmatite, experience gained from mining other parts of the deposit, and much help received from friendly local people among whom the Zellers of Dixon will always stand foremost. And if the operation is to continue to be a success in the future there will also be the factor of knowing how soon to stop mining when no more beryl is in sight.

### Acknowledgments

Grateful acknowledgment is made to Professor E. S. Larsen, Jr., of Harvard University who first suggested the mine as a possible source of tantalum, and to Dr. R. H. Jahns of the U. S. Geological Survey and Mr. C. H. Johnson of the U. S. Bureau of Mines who made possible the milling of much of the microlite ore and were responsible for the diamond-drilling exploration of the pegmatite in 1943 during which abundant reserves of low-grade tantalum-lithium ore were found.

<sup>1</sup>E. N. Cameron, R. H. Jahns, A. H. McNair, and L. R. Page: The Internal Structure of Granitic Pegmatites. *Economic Geology*, Monograph 2, 1949.  
R. H. Jahns: Geology, Mining and Uses of Strategic Pegmatites. *Mining Engineering*, Jan., 1951.

The mule, Beryl, stands near the tunnel entrance. High-grade beryl is dumped down wooden chutes then cobbled and sorted while being stacked on a platform.





# WORLD-WIDE LEAD-ZINC PRODUCTION FALLS SHORT OF DEMAND AND SMELTER CAPACITY

*International shortages of lead and zinc and a domestic and world price varying as much as 100 percent have focused attention on these metals. The world's lead and zinc situation and outlook was presented by Mr. Wilcox at the 23rd annual meeting of the Lead Industries Association and the 33rd annual meeting of the American Zinc Institute.—Ed.*

A thorough knowledge of the world situation is important when dealing with strategic world commodities such as lead and zinc, which are sensitive to international trade and general industrial activity. This is particularly true at a time when the lead and zinc industry throughout the free world is doing everything possible to continue to supply a seemingly insatiable consumer demand. The demand has been brought about by the imposition of mutual defense programs upon civilian economies of the free nations currently representing rates of industrial activity one-third to better than double that of the prewar or 1938 rate.

To appraise and evaluate the current and likely immediate future situation better, let us first review the overall production and consumption of lead in 1950.

In 1950, under the stimulus of increasing prices, the world mine production of lead showed a substantial improvement of about 119,000 tons<sup>1</sup> of recoverable lead or an increase of about 8.8 percent over 1949. The percentage increase for zinc production was more remarkable, 10.7 percent over 1949, and tonnage-wise, about 171,000 tons of recoverable zinc was produced above the 1949 output.

However, even these performances failed to meet world-smelter demand in 1950 and world-smelter production was only obtained by a reduction in world stocks of mine product—about 65,000 tons of recoverable lead and 38,000 tons of zinc.

Particularly significant is that 1950 marked the third consecutive year in which mine stocks of both lead and zinc were reduced. For the three-year period, 1948 to 1950, in-

<sup>1</sup>All figures are in metric tons.

**By R. L. Wilcox**

Chief, Nonferrous Metals Branch  
Economic Cooperation Administration  
Washington, D.C.

indicated reduction was about 106,000 tons of recoverable lead and 225,000 tons of zinc.

In view of the facts outlined above, the world lead and zinc situation may be summarized by saying that both mine and smelter production failed to keep pace with demand and that requirements were met only by significant reduction in the stock of lead bullion, slab zinc and mine products, with stocks remaining in producers' hands representing a minimum working inventory.

## **Zinc Smelting Capacity**

Because of the necessity for dipping into world stocks of mine product to maintain world-smelter production at the current level, it is interesting to review existing world-smelter capacity and the extent to which it was utilized in 1950.

Admittedly, capacity figures are somewhat theoretical with little or no allowance for work stoppages due to labor difficulties, normal repairs, and the like, but even taking such factors into consideration, to assume that in 1950 excess world capacity amounted to at least 150,000 tons is safe.

## **United States Position**

Under the stimulus of an unprecedented peacetime demand and increasing prices, United States mine and smelter production in 1950 increased slightly over 1949 but still failed to satisfy demand by substantial margins, with indicated net import requirements of 277,000 tons of pig lead and 128,000 tons of recoverable lead in ores and concentrates, and 91,000 tons of slab zinc and 265,000 tons of recoverable zinc in ores and concentrates.

To summarize, the current United States lead and zinc position emphasizes—as was also the case in 1949—the need for increased domestic mine production to maintain smelter operations at the current level and minimize dependence upon imports of ores and concentrates. Under the stimulus of the present, and foreseeable future, with favorable prices

for both lead and zinc, mine production in the United States should increase in 1951 by an estimated 20,000 to 25,000 tons of recoverable lead and 50,000 to 60,000 tons of zinc.

However, the increase for lead will be needed to maintain smelted production achieved in 1950 and to offset substantial expected reductions in total imports of pig lead and lead ores and concentrates in 1951.

The main reasons for the expected decrease in U.S. imports of lead in 1951 are (1) that the high rate of imports obtained in 1950 was achieved only as the result of substantial reductions in foreign producers' stocks which are now at a minimum and (2) the fact that the U.S. price is considerably below prices in other world markets.

## **Mexico's Lead Position**

In 1950 Mexico slightly improved its historical net export position with indicated exports of 235,000 tons of pig lead. In fact, the 1950 production rate for both mine and smelter exceeded the prewar rate for the first time in the last 12 years. Barring any major adverse development, Mexico should have little difficulty in maintaining its current position over the next few years.

## **Canada's Position**

In 1950 Canada continued its historical net export position for lead metal, zinc in ore and concentrates and slab zinc. While the statistics indicate no exports of lead in the form of ores and concentrates in either 1949 or 1950, actual exports amounted to 18,000 and 17,500 tons of recoverable lead, respectively, presumably from stocks. Actual exports of lead metal were 104,500 tons.

Exports were 97,000 tons of recoverable zinc in ores and concentrates and 134,000 tons of slab zinc, respectively. Actual 1950 exports show Canada exported 133,200 tons of slab zinc and 117,500 tons of recoverable zinc in the form of ores and concentrates. This last figure would indicate a substantial reduction in stocks of mine product or the result of additional recovery from the working of existing ore and tailing dumps.

Mine production of lead in 1951 is

not expected to be much different than that of 1950 but smelter production is definitely expected to be off slightly from the 1950 rate.

Current statistics for zinc would indicate that Canada should have no difficulty in maintaining or slightly improving its net export position in 1951. In fact, according to reports, output of mine products in 1951 is expected to increase by 10 percent.

#### Western Europe and Colonies

The current position of the participating countries under the Marshall Plan and their overseas colonies and territories as a group shows that while consumption and mine production of lead in 1950 were still lagging behind prewar rates, smelter production exceeded the prewar rate by a considerable margin. Zinc consumption, production and smelter production have exceeded the 1935-1938 average.

The participating countries have been successful in increasing lead smelter production in the past few years largely through their ability to obtain lead in the form of scrap to augment imports of concentrates. Reports from abroad indicated that the supply of scrap (largely an accumulation of war damage stocks) is rapidly being depleted and that greater dependence will have to be

placed upon imports of lead in the form of ores and concentrates in the future.

In 1951 mine production of both lead and zinc is expected to increase by 32,000 and 30,000 tons, respectively. The major increase is expected in French Africa. However, even with this increased mine production the countries will have to import lead concentrates at the 1950 rate to maintain production in the face of lessening availability of scrap. They will remain net importers of at least 170,000 and 50,000 tons of zinc in the form of ores and concentrates and slab zinc, respectively, merely to maintain their 1950 rate of consumption.

This indicated 1951 net import requirement for zinc in the form of mine product and slab zinc by the participating countries should be compared to the United States' indicated 1951 net import requirement of about 165,000 and 90,000 tons of zinc in the form of mine product and slab zinc, respectively, merely to maintain its 1950 rate of consumption. This is important since both the United States and the participating countries draw upon the same outside sources for their marginal requirements.

#### Future World Outlook

With the various nations through-

out the free world embarking upon mutual defense programs as well as making every effort to maintain civilian economies at their current high level, the immediate outlook for 1951 would indicate a continued high demand for lead and zinc with increased pressure towards higher prices in the world markets.

Two additional distinct possibilities exist that could either ease or aggravate the immediate outlook:

a. Favorable developments in the Korean and Far East situation and/or miscalculation of the real needs for metals for defense programs could ease the over-all demand.

b. Unfavorable developments in the Far East and/or European situation could aggravate the demand for metals to a degree that could require all-out control over production and distribution throughout the free nations of the world.

However, regardless of whether an optimistic, pessimistic, or middle of the road viewpoint is taken, the immediate statistical position of the zinc industry throughout the world, wherein producers' stocks of both slab zinc and mine product are at minimum working levels, would indicate that any resultant price adjustment upward or particularly downward in the near future could not be of great magnitude.

1950 Lead and Zinc Consumption, Mine and Smelter Production in Metric Tons by Countries

Country	LEAD			ZINC		
	Consumption	Production		Consumption	Production	
		Mine	Smelter		Mine	Smelter
United States .....	797,000	392,000	520,000	919,000	563,000	828,000
Canada and Newfoundland .....	51,000	154,000	154,000	51,000	282,000	185,000
Mexico .....	10,000	237,000	245,000	7,000	173,000	49,000
South America .....	56,000	118,000	54,000	25,000	107,000	5,000
Europe Total .....	538,000	209,000	385,000	683,000	303,000	584,000
Austria .....	9,000	4,000	10,000	6,000	3,000	1,000
Belgium and O.T. ....	45,000	0	62,000	65,000	63,000	175,000
Denmark .....	12,000	0	0	9,000	0	0
France and O.T. ....	74,000	78,000	88,000	101,000	31,000	71,000
Germany .....	97,000	45,000	140,000	156,000	69,000	141,000
Italy .....	45,000	39,000	42,000	35,000	67,000	38,000
Netherlands .....	38,000	0	6,000	24,000	0	19,000
Norway .....	7,000	1,000	0	12,000	4,000	44,000
Sweden .....	24,000	19,000	17,000	21,000	28,000	0
Switzerland .....	17,000	0	0	11,000	0	0
United Kingdom .....	164,000	3,000	3,000	241,000	0	72,000
U.K.O.T. (Rhodesia) ..	Neg.	14,000	14,000	0	32,000	23,000
Other Europe .....	6,000	6,000	3,000	2,000	6,000	0
Other World .....	115,000	356,000	316,000	166,000	336,000	168,000
Australia .....	34,000	219,000	201,000	52,000	195,000	85,000
Japan .....	12,000	11,000	16,000	43,000	52,000	49,000
Spain .....	25,000	31,000	33,000	20,000	50,000	22,000
South Africa .....	10,000	27,000	.....	15,000	9,000	0
Yugoslavia .....	10,000	66,000	66,000	8,000	30,000	11,000
Finland .....	.....	.....	.....	3,000	4,000	0
India .....	.....	.....	.....	25,000	0	0
Miscellaneous .....	24,000	2,000	0	.....	.....	.....
TOTAL WORLD .....	1,567,000	1,466,000	1,674,000	1,851,000	1,764,000	1,819,000

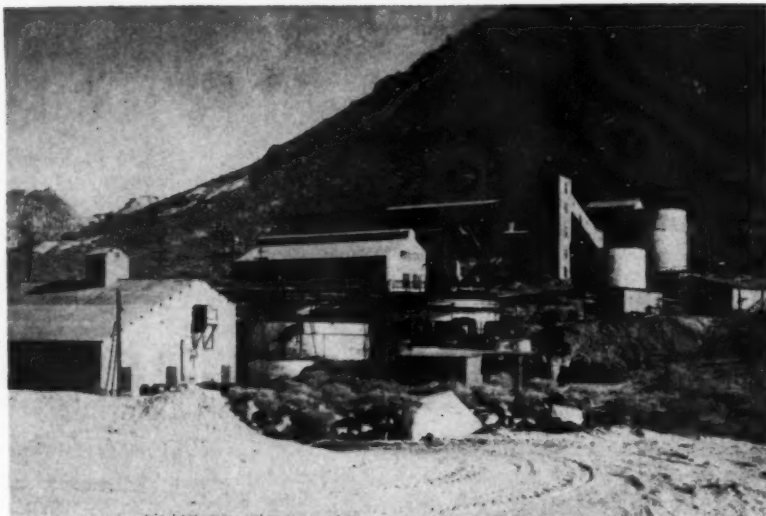
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1—Ingersoll-Rand 30 MNM-3C Three Drum  
6—Ingersoll-Rand 20 NM-2C Two Drum  
6—Sullivan HDA Two Drum  
6—Ingersoll-Rand D6U Single Drum  
1—Western Machinery Winze Type 10 HP S.D.  
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Miles of road must be built to mineralized areas where Indian trails have been the only mark of civilization.



Scores of mines have been developed. Carnotite is found in relatively small orebodies, precluding mass.

## HOW URANIUM PRODUCTION GROWS

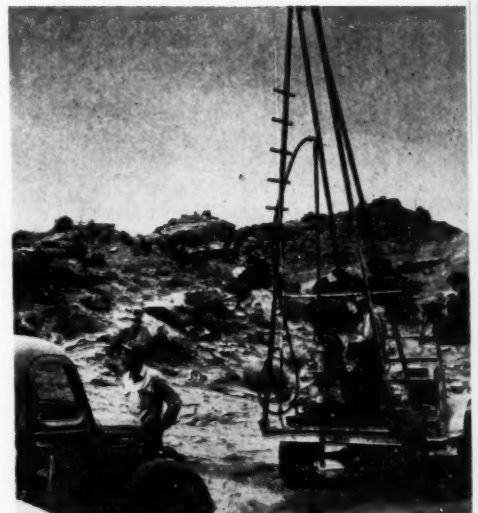


ABOVE: The deep hole percussion drill is a new exploration tool. BELOW: Every mine car of ore counts in the atomic energy age.

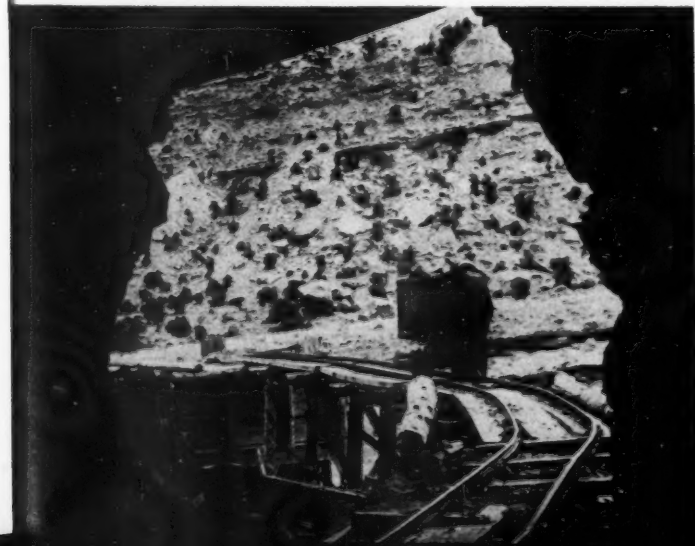
United States Atomic Energy Commissioner, Sumner Pike, has reported that carnotite production from the Colorado Plateau is the source of more uranium than all of Canada's rich pitchblende mines. The increase in tonnage mined "is almost spectacular."

This production has been made possible by men of vision and courage—the prospector, geologist, mining engineer and the small miner—and by the backing of an aggressive government commission. They have found, explored, developed and brought into production new mines in the most inaccessible and unknown parts of the country.

Activities of the Consolidated Uranium Mines, Inc., and the Utah Uranium Corporation, as pictured here, show why and how production is being increased.



ABOVE: Diamond drills find and delimit the deeper orebodies. BELOW: Ore is trucked several hundred miles to processing plants.

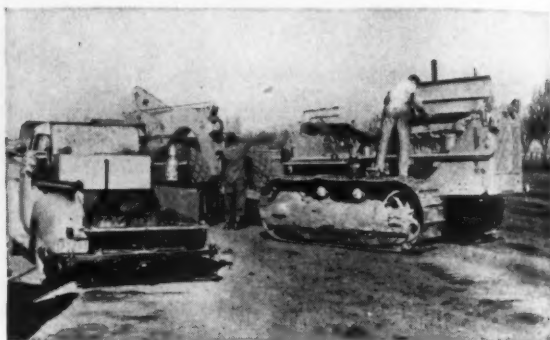
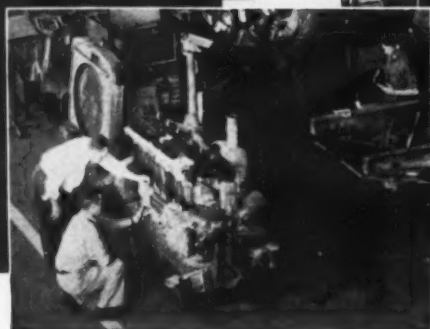




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## ACTIVITIES OF INTERNATIONAL MINING MEN

**A. Raja Rau**, former superintendent of Mines for the Gwalior, India, government and since then mining geologist and engineer for M/S The Udaipur Minerals Ltd. and Mahabir Mica Company, has been engaged by M/S Rajputana Corporation Ltd. at Jaipur to superintend mica and beryl mines. His address remains the same: Station Road, Lashkar, Gwalior, India. Another employe of Rajputana Corporation, **H. Rajarama Rao**, who is chief superintendent and agent, is in Bombay on leave for several months.

**R. R. Porter**, consulting metallurgist, has left Northern Rhodesia, where he was with the Rhokana Corporation, and is now with the Uranium Production Department of the Transvaal Chamber of Mines, 45 Main Street, Johannesburg, South Africa.

**Dr. F. Klein**, metallurgist, formerly with the Metal Corporation of India at Katrasgarh, left India in June and can be addressed at Rudolfstrasse 51, Aachen, West Germany.

**M. A. Moore**, formerly with the Associated Minerals Pty. Ltd., Queensland, Australia, is now working for the Rutile Sands Pty., Currumbin Beach, Queensland.

**Frank R. Hocky** has been awarded the Australian Institute of Mining and Metallurgy medal for 1950. He is general superintendent of mines and quarries, Broken Hill Pty. Company Ltd.

**S. A. J. Hopper** has been appointed manager of Golden Manitou Mines, Val d'Or, Quebec, Canada. He had been assistant manager. **D. M. Isbister**, formerly superintendent for Golden Manitou, and manager for Norlartic Mines, has accepted a job with Barvue Mines Ltd., Quebec, as manager.

**Dr. J. Visman** has moved from Brunssum, The Netherlands, to Canada where he has become senior mining engineer with the Mines Branch, Division of Fuels, Department of Mines and Technical Surveys. His address is 20 Riverside Drive, P. O. 743, Billingsbridge, Ontario.

**J. Campbell Jenkins**, chief metallurgist of the Electrolytic Refining & Smelting Company of Australia Pty. Ltd., has resigned to accept a position with the Mufulira Copper Mines, Northern Rhodesia, Africa. He left Australia in June and is spending some time in the United States before going on to Africa. Two other men with Electrolytic Refining, **A. F. Evans**, manager and **A. G. Mills**, technical superintendent, have been in the United States on a business trip.

**L. M. Slaght** has been appointed director of the Foreign Division of the National Production Authority, United States Department of Commerce, Washington, D.C. He recently served for three years in the Industry Division of the Economic Cooperation Administration and previous to that spent a year abroad as a member of the American Mission for Aid to Greece. In his new job he will deal with government commitments proposed by such agencies as ECA, the Office of International Trade, the Export-Import Bank and World Bank.

**C. B. E. Douglas**, retired from regular work on March 31 after 23 years with the United States Smelting Refining and Mining Company and its subsidiaries, most of which time he spent in Mexico. He first was field engineer, then successively superintendent of the Mexican subsidiary through which exploration and examination work in Mexico were conducted, sub-director of the Compania Real del Monte y Pachuca, and consulting mining engineer for the parent company, which position he had held since January, 1945. He expects to continue living at 65 Livermore Road, Wellesley Hills, Massachusetts, and may take up some consulting work.

**Frederick H. Dakin**, consulting mining engineer of Burlingame, California, is in Washington, D.C., with DMA in connection with antimony investigations. From Washington he will make a trip to Mexico. He has had wide experience in Mexico with the Sierra Madre Exploration Company, Republic Mining and Metal Company and the Texas Mining and Smelting Company and purchased antimony ores for the latter.

**J. West** has been made chairman, and **H. E. Wilson**, deputy chairman of the newly formed Nigerian Chamber of Mines, a consolidation of the local council of the Nigerian Chamber of Mines and the Nigerian Mining Association. There are 66 members, representing the mining companies and private mining operators of the district. Mr. Wilson is general manager of Amalgamated Tin Mines of Nigeria.

**H. L. Roscoe**, vice president and general manager of Noranda Mines, Ltd., Toronto, Ontario, Canada, will turn over the position of general manager to **R. V. Porritt**, who is now manager, on July 1. **C. E. Anderson**, assistant manager at Noranda's Quebec mine, will replace Porritt. **J. H. Stovel, Jr.**, manager of Pamour Porcupine Mines, Ltd., will replace Anderson, and **T. R. Wearing**, mill and plant superintendent at Pamour, will replace Stovel as manager at Pamour.

**A. H. Barrios**, mining engineer and AIME member, has returned to South America after an absence of ten years. He was in the U. S. first in the Army,

then at the Mackay School of Mines, from which he graduated, and for the past year and a half was with the Anaconda Copper Mining Company at Butte, Montana, as a trainee. He is now at Anaconda's Andes Copper Mining Company at Potrerillos, Chile, as mine foreman.

**IWAO SONOHARA** is the new managing director of the Japan Mining Industry Association, having succeeded Toshimasa Fujii. The association is located at 19, Kobikicho 8-chome, Chuo-ku, Tokyo, and is a government organization dealing with all



of the country's mining and geologic plans and problems.

**Robert Stillson Sanford**, who has been in Nepal on investigations for the United States Bureau of Mines, has left Khatmandu to survey the Gandaki River region. Gold-bearing sands which may provide a workable mining operation are one object of the study.

**Roy A. Hunt**, president of the Aluminum Company of America since 1928, was named chairman of the executive committee, and **I. W. Wilson**, senior vice president, was made president at a recent meeting of the company's board. **Leon E. Hickman** was elected vice president and general counsel. Hunt joined Alcoa in 1901. He is the son of **Captain Alfred E. Hunt**, first president and one of the founders of the company.

**Charles B. Russell**, former captain of Oliver Iron Mining Company's Geneva mine, Gogebic iron range, Michigan, U.S.A., has gone to Brazil to work at the Morro de Mina manganese mine, owned by Companhia Meridional de Mineracao of Rio de Janeiro, in which the United States Steel Company has an interest.

**Dr. Oliver B. Hopkins** is the new president of the Canadian Institute of Mining and Metallurgy. He is vice president of Imperial Oil, Ltd.

**Dr. Per Thorslund** has been appointed professor in geology at the University of Uppsala, Sweden.

**Dr. Kerr-Cross**, mining engineer with the Geological Survey of India, accompanied by three other engineers, is prospecting lead and silver mines at Pindki, at 11,000 foot elevation in the Yamuna Valley. The surveying party just completed some work at Tehri where outcrops of copper, lead, silver and iron exist.

**Anthony M. Mastrovich**, former resident engineer for the American Smelting and Refining Company at the Van Stone mine, Northport, Washington, has transferred to Nicaragua. He is now assistant general manager of the company's subsidiary, Neptune Gold Mining Company. **P. A. Lewis** has taken over at the Van Stone operation.



**BENJAMIN F. FAIRLESS**, president of the United States Steel Corporation, has been awarded the Bessemer Medal for 1951 by the British Iron and Steel Institute in recognition of his distinguished services to the iron and steel industry. He is also vice president of the American Iron and Steel Institute, at the 59th general meeting of which the award was given by Sir Charles Goodeve, director of research of the British Iron and Steel Research Association. The Bessemer Medal was first presented to Sir Lowthian Bell, 77 years ago.



## INTERNATIONAL NEWS

### Barvue Mine to Ship Zinc To American Zinc Co.

Barvue Mines Ltd., a subsidiary of Golden Manitou Mines, Ltd., of Canada, has concluded an agreement to ship 175,000 short tons of zinc concentrate to the United States' zinc smelters of the American Zinc, Lead & Smelting Company for processing. American Zinc has offered to sell the refined zinc to the American Steel & Wire Company, a subsidiary of the United States Steel Corporation.

Initial shipment of concentrates is scheduled for March 1952, at which time Barvue plans to have its new openpit mine and 4,000-ton-per-day mill in operation. Diamond drilling has proven 17,000,000 tons of 3.2 percent zinc and 1.1 ounce per ton ore at the property in Barraute Township, Quebec.

Zinc concentrates from the mill will be shipped first to Arvida, Quebec, for roasting in a new plant being built by the Aluminum Company of Canada, Ltd. The zinc calcine will then be shipped to the United States. Freight costs will be reduced and additional revenue will be gained from the production of 50,000 tons per year of sulphuric acid from the SO<sub>2</sub> roaster gas.

The contract price for the zinc is 17.5 cents per pound, duty for shippers account.

### Mufulira and ECA Discuss Big Copper Development

Negotiations are proceeding between officials of the Mufulira Copper Mines and the United States' Economic Cooperation Administration and are expected to result in the allotment of £3,000,000 (\$8,400,000) from ECA technical funds for the development of the Chibuluma field. The company itself would also provide some additional finance.

According to the last annual report of Mufulira's general manager, this field contains an orebody of high grade copper-cobalt. The reserves are still being calculated. The reserves of the rest of the property are estimated at 163,000,000 tons averaging 3.89 percent copper.

Under the proposed agreement, much of the assistance will be repaid from sales of the resulting copper in the U.S. What is not yet agreed is the exact disposition of all the copper produced by this new mine.

### Japanese Firm Building New Mill and Tramway

After a long period of exploration work at the Tatemata silver-copper mine, drifting and cross cutting has proven a large orebody, and reserves are now estimated at 600,000 tons. The mine is in Akita Prefecture, Honshu, northwestern Japan and is owned by the Dai-Nippon Mining Company. Hiroshi Matsuura is president.

The 600,000 tons of proven ore are estimated to contain 100 grams of gold per ton, copper 1.80 percent, zinc 5.70 percent and sulphur 16.20 percent. The company's

development plan, now under way, includes the installation of a 150-ton-per-day differential flotation mill, an aerial tramway of 2,500 meters from the adit portal to the mill, and the addition of related equipment and machinery. Operations are expected to start in May 1952.

### Diamond Projects Backed By ECA in French Africa

Two new projects for the development of industrial diamonds in French Equatorial Africa for the United States' materials stockpile and defense production are being backed by the Economic Cooperation Administration. ECA will make advances against production totaling \$1,303,500 in French counterpart francs. The two projects bring to five those which are being sponsored by ECA in Africa, costing a total of about \$4,000,000.

The Societe Miniere Intercoloniale (SMI), a French-owned firm with headquarters at Berberati, Oubangui-Chari territory, will receive 85,000,000 francs to explore for diamonds in its properties north of Bria. If exploration is successful, large scale development plans will get under way through the advance of additional ECA funds.

The second contract provides an ECA advance of up to 205,000,000 francs for expansion of diamond production in areas in which SMI already is operating. SMI will use considerable sums of its own for this work. The company has been producing about 25 percent of the diamonds in the area since 1938.

### Initial Contracts Let For BC Aluminum Plant

The Aluminum Company of Canada, Ltd., is proceeding with its program for establishing power plants and aluminum processing facilities in northwestern British Columbia at an ultimate cost of about \$550,000,000. The construction of the first stage of the development will represent an expenditure of \$160,000,000 and will result in the production of 150,000 tons of aluminum yearly. The plant, which will treat alumina delivered by ship, in bulk, from plants to be expanded in the Caribbean area, is being established at Kitimat on Douglas Channel, where a townsite that may eventually have a population of several thousands is planned.

Production of aluminum on an economical basis depends on the abundance of cheap water power, and it is to be provided by the damming of the Nechako lake and river system. At first 420,000 hp. will be developed, but the system eventually will produce 1,600,000 hp. The power plant will be about 48 miles from Kitimat and electrical energy will be transmitted by overhead lines across the mountains to the tidewater smelter.

Morrison-Knudsen Company, Boise Idaho, and association companies have the major construction contracts for this project. Mannix Ltd. of Calgary and Northern Construction Company and J. W.

Stewart, Ltd., Vancouver, both affiliated with M-K, are building access roads, and M-K will start on the tunnel project late in the fall.

### Chile and U. S. Report on Chilean Mercury Deposits

At the request of the Government of Chile, geologists of the Department of the Interior of the United States, in cooperation with Chilean scientists, have completed a survey of Chile's quicksilver deposits.

Quicksilver has been mined intermittently in Chile since it was first discovered near Andacollo in 1778. Chile in 1943 held seventh position among non-Axis producers and contributed about 1.4 percent of the production that year (exports amounted to at least 2,500 flasks).

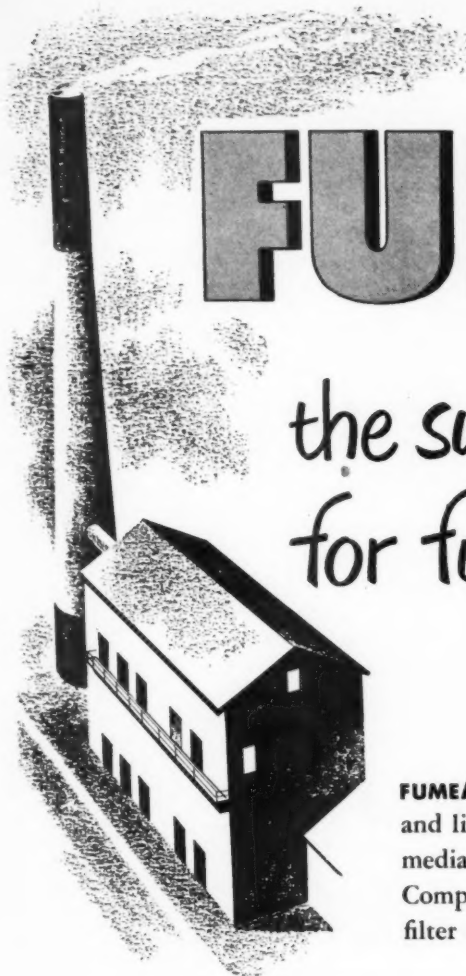
The deposits lie mostly within a narrow strip extending for about 310 miles from Copiapo in north central Chile to Illapel, about 125 airline miles north of Santiago. They are at moderately low altitudes and lie where the foothills of the Andes Mountains merge with the Coast Range. Reserves have been measured by the operators of one mine only, where exploitation depended on profitable extraction of gold. Reserves even of inferred ore at other deposits were slight and economically marginal. A little native mercury occurs in places but the principal ore minerals are coarse-grained cinnabar, mercurian tetrahedrite and powdery cinnabar mixed with oxides of iron and antimony in the weathered veins. Most of the ore is localized in shattered and crushed zones along steep faults.

A report on the findings of the two governments has been published by the U.S. and is available on request.

### Norwegian Sponge Iron Plant May Be Approved

A United States project is being considered by the Norwegian Government whereby Norway would supply the United States and European steel makers with sponge iron which could be used besides scrap. In Norway sponge iron can be produced cheaply because of the low-cost electric power.

The plan proposed is to build a plant at Larvik on the southeast coast of Norway for production of 60,000 tons of alloy steel ingots and an excess tonnage of sponge iron. Cost for initial erection of three sponge iron units and three 25-ton electric furnaces would be \$6,000,000. The Norwegian Ministry of Industry, the Economic Cooperation Administration and Dennis R. Scanlan of St. Paul, Minnesota, U.S.A. and his associates have discussed the plan for a long time and have contacted steel makers throughout the western world, who have been enthusiastic. At the present moment, the idea looks as if it would go through; the start of plant construction at Larvik tentatively is scheduled for August.



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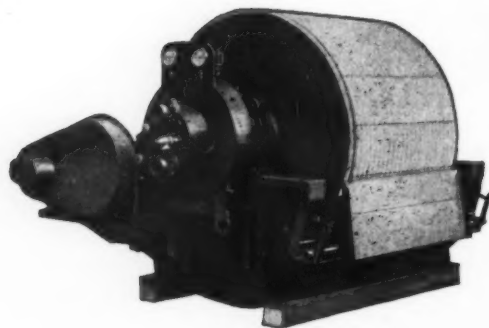
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## INTERNATIONAL



### OCEANIA

**NEW SOUTH WALES**—Scheelite Consolidated N. L. is a new company formed to work tungsten deposits at Frogmore, near Yass in the south-central part of the state.

**NORTHERN TERRITORY**—Noble's Nob, the rich mine at Tennant Creek, continues to clean up record yields—over 6,900 ounces of gold were recovered from under 1,000 tons of ore, which included 4,000 ounces from 67 tons mined from one winze below the 215-foot level. In the last 18 months this mine has distributed 300 percent in dividends on £A150,000 capital. The operating company, *Australian Development N. L.*, is making a two-monthly dividend of 75 percent at the present time. The other mines in the Tennant Creek field are not faring as well—increased costs are causing some of the smaller operators to transfer their activities to the wolframite deposits in the locality.

**WESTERN AUSTRALIA**—Recent mining activities reported in this state include the following: The first shipments of iron ore from the newly completed Cockatoo Island plant at Yampi Sound on the far northwest coast will soon be shipped to Port Kembla, N.S.W. The *Broken Hill Proprietary, Ltd.* has secured an option on a lease at the Greenbushes tin field and is making examinations of the property. *Meekathowa Sands Treatment and Mining N. L.* found so much sulphide in the Consol dump that operations have been transferred to the *Fenian* dump. The company is trying to maintain an average of 300 tons per day. *Blue Spec Mining Company N. L.* is negotiating with overseas interests for the sale of its antimony concentrates. And operations of the *Porphyry Gold Mines* were suspended because of a lack of manpower. Western Australia's gold output for the first three months of the year was reported to be 149,483 fine ounces, or about two-thirds of the country's output. However, the state's gold future is seriously menaced by not only a lack of manpower, but also lack of supplies and lack of confidence. Production costs have doubled since 1934 and small mines see a black year ahead.

**PHILIPPINES**—*Atok-Big Wedge Mining Company* handled 13,170 tons of ore in April 1951 for a recovery of \$136,110. Figures for April 1950 were 12,729 tons for \$149,941. Atok declared a dividend of one centavo per share and paid it on April 16th.

**AUSTRALIA**—Australian customs officials have confirmed reports that a world-wide racket in gold smuggling is operating in Australia with gold being sold on the Honk Kong market above the set price.

**NEW GUINEA**—*Gold Mines of New Guinea, N. L.* has been discouraged by reports of its engineer that values in the Bena river boreholes do not warrant further operations. On the other hand, *Consolidated Gold Mining Areas N. L.* expects to produce 3,000 tons a month from its *White Hope* mine at Hampton Plains.

Reserves of ore are said to be 35,500 tons at 8.4 dwts. per ton.

**AUSTRALIA**—Bauxite reserves of the Australian Aluminum Commission now stand at 8,600,000 tons and the Commission is negotiating with overseas interests for the purchase, at suitable delivery dates, of high-grade Malayan ores. The Commission also has purchased from Norway a large quantity of fabricated steel for aluminum factory buildings to be built at Bell Bay, Tasmania. Local consumption of aluminum in all its forms in the country is estimated between 13,000 and 14,000 tons per year.

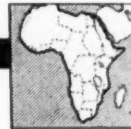
**SOUTH AUSTRALIA**—An aerial survey using magnetometers is planned for the Middleback Ranges on the Eyre Peninsula in order to locate possible iron ore deposits.

**VICTORIA**—*Maude & Yellow Girl Gold Mining Company N.L.*, Glen Wills, reported its ore reserves at 65,000 tons including 36,680 tons of probable ore. Last year the mill crushed 9,065 tons for an average recovery of 6.5 dwts. per ton. Ore is crushed by a stamp battery. Annual production objective is 15,000 tons.

**NEW GUINEA**—*Bulolo Gold Dredging Ltd.* treated nearly 14,000,000 cubic yards of gravel last year for a recovery of 71,000 ounces of fine gold and 32,000 ounces of silver. Reserves are 90,000,000 cubic yards of dredgable gravel at a reported 20.8 cents per cubic yard, and 13,000,000 cubic yards to be worked hydraulically for a recovery of a reported 18.62 cents per cubic yard. Over 2,000 tons of supplies were transported to the leases during the year—1,741 tons by air freight.

**PHILIPPINES**—The Bureau of Mines of the Philippines recently completed a survey of Southern Surigao under the direction of Dr. M. H. Tupas. Among regions investigated was the Agusan-Surigao divide region and the Lingig-Bislig peninsula, where numerous occurrences of placer gold were noted. The only com-

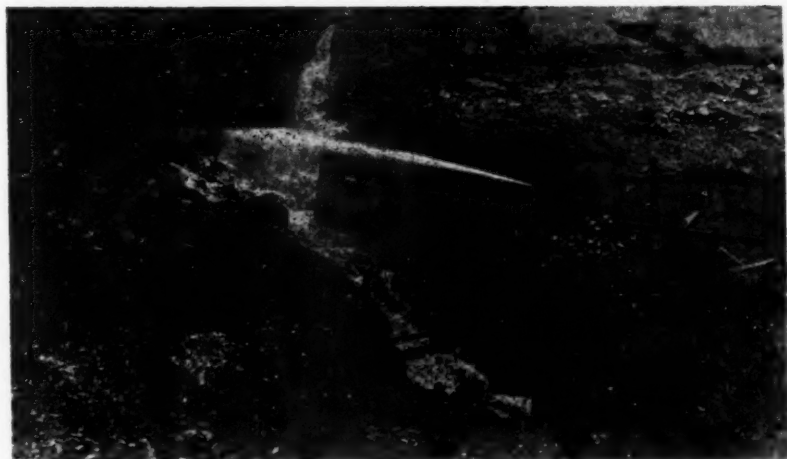
mercial placering in this area is done by the *Tambis Gold Dredging Company, Inc.*, Lianga. Tambis owns 12 claims in which drilling has proved 630,000 square feet of payable ground, 24 feet in depth and valued at 0.72 Peso per cubic yard. The high cost of machinery is hampering the company considerably. The survey found also that gold can be panned in the tributaries of the Hinatuan River; can be sluiced at spots along the Usa creek; and that placer gold also exists at Tidman River, Kapatdan Creek, Ubon Creek and creeks north of Surigao Colorado.



### AFRICA

**SOUTH AFRICA**—The capital of the *Union Tin Mines Ltd.* is being increased to 1,600,000 shares of two shillings, six pence each, of which 400,000 will be held in reserve. Participating in the increase are the *Anglo-Rand Mining & Finance Corporation Ltd.*, *Beatrice Gold Mining Company, Leader Mining & Investment Company Ltd.*, and, through them, their shareholders. The purpose of the increase is to provide funds for conducting mining operations on the farm Doornhoek 896, Waterberg district, Transvaal. The mineral rights over 2,114 morgen, buildings, plant and equipment have been bought, and the property should be in operating shape in November. Additional options are held over 303 morgen on the adjoining farm Kromkloof 697. Previous operations at Doornhoek farm were conducted during the period from 1908 to 1914 when recovery was from 0.92 percent to 1.50 percent tin. Workings were extended to a depth of 600 feet then.

**SOUTH WEST AFRICA**—The HMS pilot plant purchased by *The Consolidated*



### SLUICING IN THE REMOTE WAU VALLEY

Natives are sluicing for gold in the Koranga open cut, one of the leases of the *Guinea Goldfields Limited* at Wau, New Guinea. The water comes from mountain streams through 6,000 ft. of steel fluming and through several miles of water races. The Koranga lease uses about 35 cubic feet per second. About 7,000,000 cubic yards of ore has been taken from the cut which is 275 feet deep. Koranga ore reserves are estimated at 7,800,000 cubic yards with an average value of 1/- per yard.

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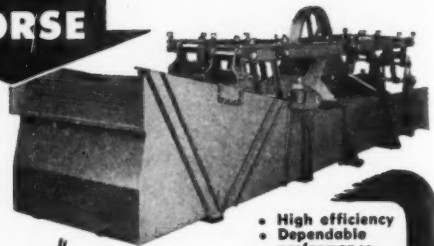
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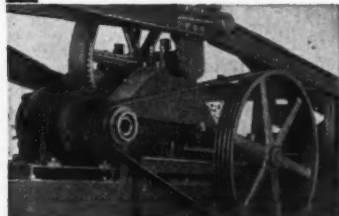
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13 ISSUES

Diamond Mines of South West Africa, Ltd. from the Premier Diamond Mining Company, Ltd. should be incorporated in the central concentration plant shortly. Installation of the electrostatic and grease-belt-recovery units has been held up by work on further improvements developed during experimental work and by fabrication delays, but these units also should be in operation almost at once. Production in the current year will first be raised to about 40,000 carats per month and later to about 50,000. In the year ended December 31, 1950, 377,595 metric carats were recovered from 470,491 cubic meters of ground at a cost per carat of 43 shillings, two pence. Working profit was £5,352,289.

**FRENCH GUINEA**—The Societe Pechiney of France is prospecting for bauxite 250 miles northeast of Conakry at Dabota.

**FRENCH WEST AFRICA**—Production of about 150,000 tons of phosphate annually is expected from two large deposits at Thies, a few kilometers from Dakar. One deposit covers about 25 hectares (51.90 acres), is five to eight meters thick, lies beneath about 20 meters of overburden, and is estimated to contain nearly 1,500,000 tons of phosphate. The operating company is building a crushing plant on the site and a loading ramp beside the railway. Drills and mechanical shovels will be used in mining operations.

**SOUTH AFRICA**—The following reports have been received from three of the numerous mines in the South African union: Drilling by the *General Exploration Orange Free State Ltd.* and *Middle Witwatersrand Ltd.* on the Rosedale farm southeast of the Tevere Van den Hevers Rust area, west of the *Freddies North* mine, has been sufficiently encouraging so far to support prevailing optimism that two mines are likely to be established in the area. The *New Kleinfontein* gold mine on the East Rand probably will complete its program of expansion by the end of 1952. Included in the program are reopening of the old Van Ryn Deep section, extending the Glyn shaft, erecting a new crushing plant, and raising mill capacity to 125,000 tons per month. In 1950 the company milled 1,326,000 tons; in 1949, 1,295,000. The *President Brand Gold Mining Company Ltd.* in the Free State plans to raise about £125,000 to repay temporary loans and finance further development and equipment for its mine.

**SOUTH WEST AFRICA**—D. Hutchinson, mine manager for *South African Minerals Corporation Ltd.*, which is mining manganese ore in the Okahandja district, advises that assays quoted by *Mining World* in March on the company's first shipment were 51.95 percent Mn and not 41.95 percent. He also added that the assay was not for the entire shipment. The shipment, incidentally, was scheduled to leave Africa at Walvis Bay on June 3.

**BELGIAN CONGO**—Several tin mining properties on the Tanganyika-Uganda border, at Murongo, have been purchased by the *Colonial Development Corporation*, according to reports. The claims were worked by numerous individuals formerly. Colonial will work the properties as one unit and is considering increasing output.

**SOUTHERN RHODESIA**—At the *Sun-ace Mine* of *Falcon Mines, Ltd.*, a large

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## INTERNATIONAL

underground area has been defined containing scheelite in appreciable quantities, and additional plant facilities have been installed to recover and concentrate the mineral from the gold ore milled.

**NIGERIA**—The Ribon Valley (Nigeria) Tinfields, Ltd., reports encouraging results from operations at its Bauchi-area concessions. The company has proved a reported 2,391 tons of tin concentrates. About 500 men are at work. Also, tin mining started in March at the firm's small Kwall Area property where about 445,000 cubic yards of profitable ground has been proved. Hedley Williams is chairman of the company.

**GOLD COAST**—The West African Finance Corporation, Ltd., has been formed

by the Ashanti Goldfields Corporation and will take over Ashanti's shareholdings and some cash in order to hold and manage investments. The new company will remain a wholly owned subsidiary. Its directors, who are also directors of Ashanti, include Major-General Sir Edward Spears, A. d'A. Willis and Sir David Waley.



EUROPE

**BRITISH ISLES**—Britain's lead and zinc industry is reviving because of soaring

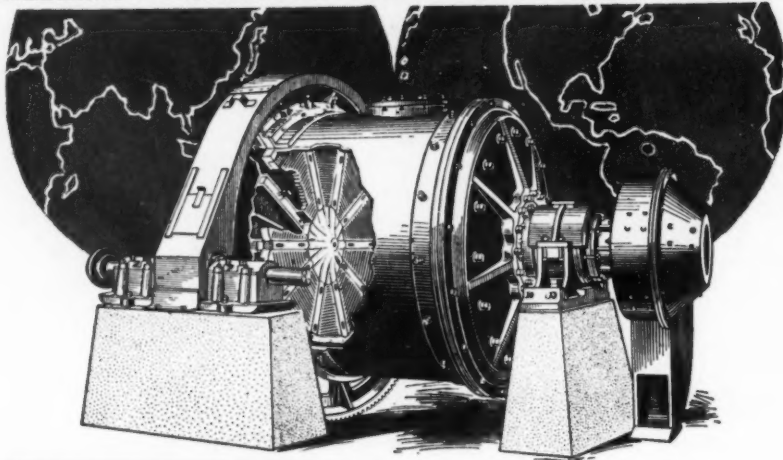
world prices and the assistance of the Johannesburg Consolidated Investment Company, Ltd., the South African mining finance house. For over 18 months, several mining companies have been carrying out geological surveys in various parts of the British Isles, especially North Wales, Derbyshire and southern Ireland, and operations in a number of areas have begun. The main areas where reserves of ore exist are in the Northern Pennines, Derbyshire and North Wales. Johannesburg Consolidated's main interests are at Llanrwst in Denbighshire where the Parc mine has been reopened and production is about 200 tons of lead zinc ore daily; a southern Ireland mine which is being worked in conjunction with the Abbeystown Mining Company of Dublin with a production of about 100 tons daily; and Matalock in Derbyshire. Production of about 70 tons of ore daily from the Trecastell mine near Conway should begin this fall. These mines will add over 3,000 tons of lead and 2,000 tons of zinc to the yearly output doubling the United Kingdom's production of lead and quadrupling that of zinc. Besides, there are several other producing lead-zinc centers, i.e., the Nentsbury mine at Alston, Cumberland; the Greenside mine in Westmoreland; and the Halkyn mine near Holywell Flintshire. The main difficulty British companies are having in opening mines is a shortage of capital, and as most mines produce from underground, the costs of dewatering and developing are nearly prohibitive, with the Government giving no assistance. However, rumors are evident now that a change of heart may be taking place and that subsidies may be forthcoming.

**ITALY**—The Association of Steel Producers advised that production of steel reached a total of 237,663 tons in the month of March compared to 202,836 tons in March, 1950. Output of pig iron was 66,941 tons against 37,019.

**ITALY**—In a review of the Sardinian iron mining industry, officials reported as follows: 1) The San Leone field, 20 km. from Cagliari, has total estimated reserves of from 10,000,000 to 12,000,000 tons suitable both for export and for local use if combined with imported coke for the creation of an iron and steel industry. This is to be done by a local subsidiary of the Italian Government-owned firm, Finsider Company. 2) The Aritza-Gadoni field (Nuoro) offers good prospects and the so-called Giaccuuru structure contains 4,000,000 to 5,000,000 tons of magnetite with a possibility of 5,000,000 more tons being proved. 3) The Salaponi-Nuedas field near Gonnoslanadiga (Cagliari) contains several hundred thousand tons of limonite. 4) The Iglesiasente and Fluminese fields have several million tons of iron ores with low-silica content, making long-distant transport unfeasible. 5) The Nurra field (Sassari) has about 2,500,000 tons of iron ore, but is said to be unsuitable for processing by the Italian iron and steel industry.

**CZECHOSLOVAKIA**—Revisions reportedly have been made in the Five Year Plan now in effect (1949-1953) in order to raise output, especially of heavy machinery. A 131 percent increase target over 1948 output rather than the 66 per-

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At dump site, 90° turn permits operator to easily maneuver his Tournarocker up to edge of bank. Front drive wheels stay on firm ground, while rear wheels may be placed on edge of loose, non-

packed embankment. At flick of a switch, simple electric hoist raises body vertically, 17 cubic yard load is cleared in a few seconds.

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Stripping magnetite at Kirkenes, Norway, 215 mi. north of the Arctic Circle, Sydvaranger, A/S, of Oslo is hauling 12,000 tons of rock overburden and ore per day with 12 big-capacity Tournarockers. Loads average 40 tons each.



Hauling gold ore at Bonanza, Nicaragua, this 9-ton Tournarocker, owned by Neptune Gold Mining Company, climbs 9820 ft. of 3 to 19 1/4% grades on trip from loading bin to refinery tramway. Cycles are completed in 40 minutes.



Mining bauxite at Onverdacht, Surinam, deep in tropical jungles, Billiton Mines of Paramaribo stripped 20 ft. of heavy, wet clay overburden with 3 C Tournarockers—liked them so well they bought 6 more for hauling ore.



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## INTERNATIONAL

cent increase originally planned has been set. Targets in hard coal, crude steel and light engineering industry are supposed to be met this year rather than in 1953, and targets in brown coal, pig iron, rolled steel goods and other manufacturers must be met in the first or second quarter of 1952. Estimated crude steel target for 1953 was 3,500,000 metric tons; production last year was about 2,700,000 tons.

**HOLLAND**—The shortage in sulphur in Holland has led to plans to make use of the sulphur in the gypsum which caps the salt strata and domes in the eastern provinces. At Weerselo and Schoonlo the gypsum lies at a depth of 150 meters; in the *Royal Netherlands'* salt industries the depth is about 280 meters. The salt and coal concession near Winterswyk, which has been idle 30 years, may also be worked for gypsum.

**HUNGARY**—With the completion of the new aluminum plant at Almasfűzítő about half of the bauxite mined in Hungary can be treated there rather than exported, as was the case before the war. A modification of the Bayer process will be used at the plant as Hungarian bauxite is a form of trihydrate.

**YUGOSLAVIA**—About \$680,000,000 will be spent in Yugoslavia this year on the construction of new electric power stations, factories and other industrial enterprises and the development of mines. Among the planned projects will be investments in new experiments in non-

ferrous metals, and in new plants to process copper before export. Zinc mines will be enlarged, aluminum production expanded and asbestos processing plants erected. (Yugoslavia has been exporting its asbestos.) Fourteen new hydroelectric plants will be built to produce 500,000 more kilowatt hours of energy. Nine new railroad lines totaling 400 kilometers will be built. About 3,000,000 dinars will be spent on modernization of the Jesenice iron and steel works. Erection of the \$3,750,000 blooming mill at the Zenica works is going slowly; eventual capacity of the plant will be 400,000 tons of coke yearly, however.

**WEST GERMANY**—The dismantled equipment from the *Vereinigte Aluminium Werke* plant at Töging will not be sent to the United States as reparations since no restrictions on aluminum production remain in Germany. The plant had an annual capacity of 11,000 tons.

**EIRE**—State mining leases have been granted to several companies and individuals recently in line with efforts to increase mining of lead, zinc and copper. In County Mayo, a copper-lead lease has been granted to Peter Kelly on property at Tawneycrower; in County Kilkenny, a lead mining lease has been granted to Joseph Knox and James Malone on property at Brownsford; and in County Sligo the *Johannesburg Consolidated Investment Company* has obtained lead and zinc leases at Kilmacowen and Lugawarry.



LATIN AMERICA

**PUERTO RICO**—The *West Indies Mining Company* recently was formed to mine iron ore in the middle of the sugar cane region, 32 miles from San Juan on the north coast of the island. E. A. Young of Hibbing, Minnesota, U.S.A., and James B. Hustad, geologist, and David Crasweller, lawyer, both of Duluth, are the main officers of the company. A crusher and screening and drilling equipment are being installed at the mine, and a power line and good road lead to the property. The property is said to contain an estimated 3,000,000 tons of ore, and samples run 60.0 percent natural iron, 4.0 percent silica, and low in phosphorus. Mining will be by openpit methods, and terms of the lease require that some ore must be shipped in 1951. The destination of the ore will be the Barium Steel Corporation of New York.

**MEXICO**—The labor peace recently achieved between some 27,000 unionists and 37 mining companies (including *American Smelting, Penoles and Fresnillo*) cost the firms about 150,000,000 pesos (\$17,200,000) in the form of pay hikes and economic benefits, according to Jesus Carrasco R., secretary general of the miners' union.

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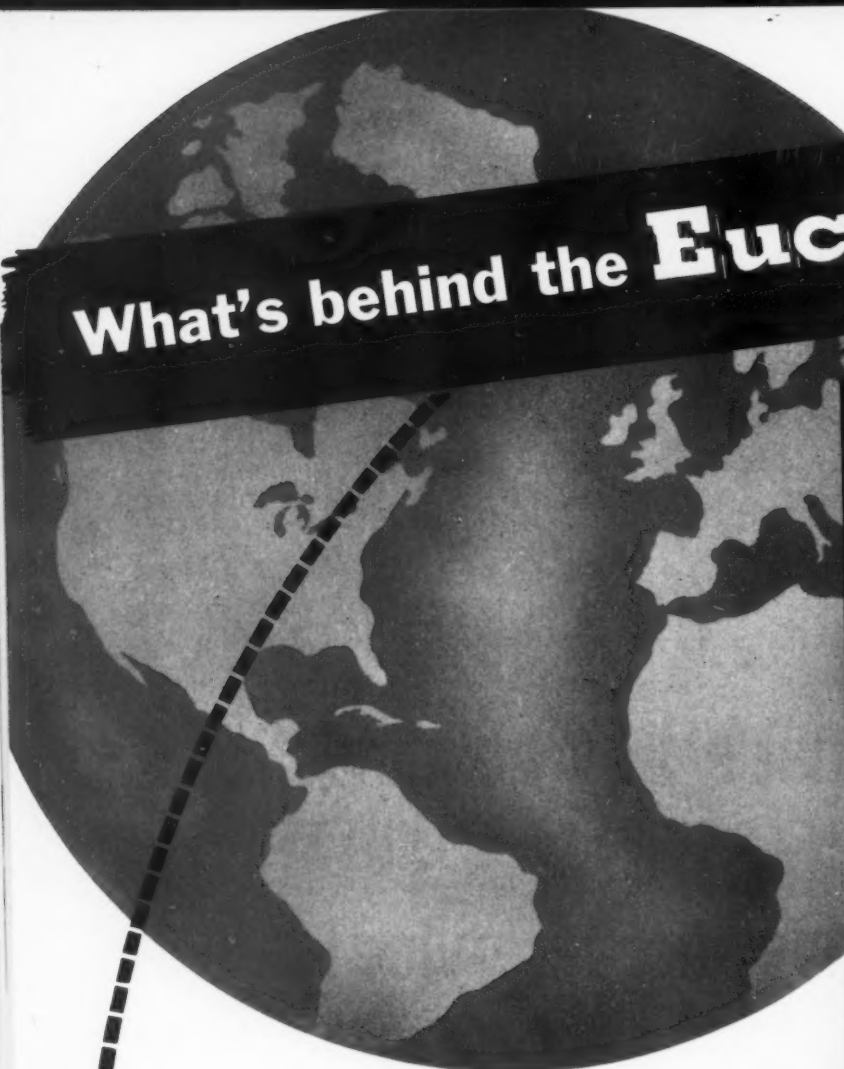
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## INTERNATIONAL

**ARGENTINA**—The Argentine Government has granted a permit to the *St. Joseph Lead Company* to ship 10,000 tons of zinc concentrates from the property of its subsidiary, *Compania Metalurgica Austral, S.A.*, to St. Joe's electrothermic smelter at St. Joseph town, Pennsylvania, United States.

**NICARAGUA**—*La Luz Mines, Ltd.*, operating gold mines at Siuna, is negotiating the possible acquisition of the *Rosita* copper mine, 30 miles from the company's gold mine. The copper property was described as high-grade.

**PERU**—The *Cerro de Pasco Copper Corporation* and subsidiaries reported for the quarter ended March 31, 1951 a net income of \$2,769,429 equal to \$2.35 a share. Sales amounted to \$10,848,250. The corporation also announced that effective from June 1951, the word "copper" was dropped from the company name.

**ARGENTINA**—Several investigations are under way which may lead to the opening of new mines in Argentina. In the Province of Salta a hematite deposit in the Unchime region of the Department of Campo Santo has been found and is considered promising. In the Province of La Rioja, preliminary studies have started in an attempt to find uranium minerals known to exist in the Cerro Torro mountains. In the Province of Buenos Aires, the *Maria Eugenia* kaolin and silver mines are being thoroughly investigated. The mines are near the town of Balcarce.

**MEXICO**—Larence B. Wright has returned to San Francisco, California, from Baja California where for several months he had been in charge of a program of mineral-resource study sponsored by the Territorial Government. The area being covered is south of the 28th parallel to the tip of the peninsula. As a result of the study so far, several crews of men are sinking and drifting on newly opened veins of silver-gold-lead ore, and one vein of copper-cobalt ore. The Federal Government of Mexico is driving a low-level drainage and ventilation adit to extend beneath the mines of the old Triunfo district.

**VENEZUELA**—A manganese deposit has been found near Upata in the State of Bolivar, according to the Ministry of Mines and Hydrocarbons, and another deposit has been found in the State of Carabobo, this discovery announced by the Venezuelan Mining Association.

**MEXICO**—Promising developments involving new discoveries and new operations are reported from the state of Sonora. A new company, *Mina San Juan y Anexas, S.A. de C.V.*, with an authorized capitalization of \$500,000, was recently incorporated by D. W. Budge of Meximinas, Ures, to cover seven of his holdings. The San Juan and Don Eduardo units, powered by Diesel, are in operation six days a week, and the ore, carrying gold, silver, copper and lead, is being shipped to El Paso, Texas, pending installation of concentrating facilities on the property. Budge, executive vice president, says the company offers no stock for sale. Another company, known as the *Minas de Guatamo*, is operating about 200 miles south of Douglas, Arizona, with 50 men employed. Occasional shipments of concentrates from a jig plant have been made for the past six months to a Mexican smelter. A 100-ton-daily flotation plant has just been completed and is about to

start operating. The indicated tonnage, not completely blocked out yet, is 15,000 tons of ore containing zinc, lead, copper and silver. The backers of the company include, M. L. Schwary of Camas, Washington, president; Q. A. Shaw, Jr., of Boston, Massachusetts, vice president; and H. J. Lynch, San Diego, California, manager. The third property, the *Mexican Development Corporation*, with holdings 75 miles up the Yaqui River from the city of Obragon in northwestern Sonora, has made its first shipment of lead-zinc-silver ore to the *Combined Metals Reduction Company* custom milling plant at Bauer, Utah. The company expects to ship one carload a week to the smelter. Officers of the company are W. B. Hendricks, president; Howard Glenn, vice president; and Ollean Palmer, secretary, all of Utah. The discovery of tungsten and cobalt in Alamos, Sonora has been reported by Alberto E. Maas. He advised also that several old copper, silver-lead properties have been reopened, that several claims have been filed on new deposits of zinc oxide, lead and zinc ores, and that records for claim-filing had been broken in the Alamos mining office. He also advised that Dr. Jose M. Guerrero of Navojoa is mining manganese ore near the Yaqui River and will ship it to the United States' stockpile, and that two carloads of cobalt ore from the *Carlos Valenzuela* cobalt mine near San Bernardo in the Alamos district are awaiting shipment to the U.S. The Mexican Government has begun building a new highway to Alamos from Navojoa.

**VENEZUELA**—Field crews of the government are investigating indications of radioactive minerals in the Andes and Guyana mountain ranges and iron deposits

in the State of Bolivar. To assist in studying the latter, the International Aero Service Corporation of the U.S.A. is carrying out aeromagnetic surveys in cooperation with the government.

**MEXICO**—A. S. Schaefer and Associates, operating the *El Gavilan* mine in the State of Chihuahua, are now crushing, grinding and jigging lead ore. The high grade lead-silver-gold concentrate is shipped to the Chihuahua lead smelter of the *American Smelting and Refining Company*.

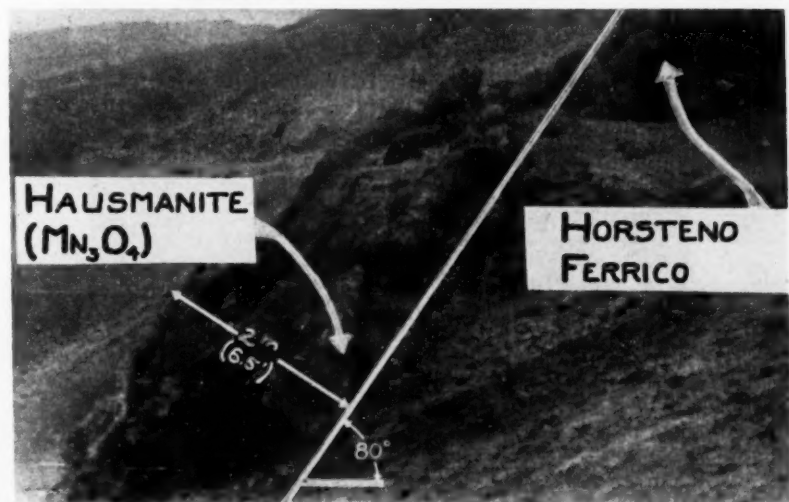
**EL SALVADOR**—Surveys of the sulphur, chalk and lime deposits in the country are now being carried out by the newly formed Central Office of Commerce, Industry and Mining. The agency is said to have discovered chalk and lime in the Lake of Alegria and Ahuachapan regions.

**BRAZIL**—Copper deposits worthy of exploitation are said to have been found in the State of Ceara by Brazilian Deputy Adolfo Gentil. He is assisting in finding investors to develop the find.



**TIBET**—A survey party consisting of 200 Russians reportedly will visit northern Tibet to seek deposits of coal, oil, nonferrous metals and minerals.

**THAILAND**—As a result of a three-month survey made by the Thailand Department of Mines and a United States



### MANGANESE CROPS OUT ON PERUVIAN PEAK

At the *Mina San Pedro* the San Pedro vein of high grade manganese ore (hausmannite  $Mn_3O_4$ ) crops out on the side of a Peruvian peak. The vein is one of seven currently being developed by Pedro Rosello, T. and I. W. Mather, long-time consulting mining engineer in Peru. The veins are at an elevation of 14,000 feet in the Department of Puno, 55 miles inland from Tirapata, a station on the Mollendo-Cuzco railroad line of the Southern Railways of Peru. A road has been built, a camp erected, and 125 men are now open-pit-mining the manganese ore. A second shipment of 1,400 tons of ore recently was made to the United States. A new contract has been signed for the purchase of 3,000 tons of ore by the Mercantile Metal Ore Corporation of New York.



## INTERNATIONAL

Geological Survey scientist, David A. Andrews, the Thai Government expects to start development and mining of two lignite deposits to help alleviate Thailand's critical shortage of solid fuels for operation of its railroads and to produce electric power. The U.S. Economic Co-operation Administration provided the funds for the survey, and the U.S. Geological Survey made a report on the project advising extensive exploration of the deposits and establishment of a pilot plant with equipment for strip mining, cleaning or washing and briquetting. The deposits are in the Bang Poo Dum lowland area southeast of Krabi, on the west coast of the peninsula, and in the Mae Moh area east of Lampang, near the northern terminus of a railroad. Thailand reportedly will need over 600,000 tons of coal annually by 1952 to save wood for fuel, and could use 1,000,000 tons within three years, if available. Several million tons of coal can be mined by strip operations at the Bang Poo Dum site, according to present information.

INDIA—Quarrying of wolframite has been resumed in Rajasthan after a lapse of nearly five years. Operations are going on in the mines at Digana, in Rewat Hills, Jodhpur State, where 400 workers are quarrying the mineral for export. Operations may be increased and, with the help of the Indian Bureau of Mines,

plans are being made to undertake mineral dressing of the ore.

INDIA—The Geological Survey of India and a Norwegian expert have completed a joint investigation of the iron ore deposits of Salem and Sandur, Madras State, and have recommended the establishment of an iron and steel industry on the strength of discoveries in Sandur, particularly. Electric furnaces would be used, as coal is lacking. Power would be provided by the Tungbhadra and Mysore dam projects.

CHINA—Crude oil production in 1950 increased 35 percent over the previous year and refined oil production 17 percent. During the year 3,000 square kilometers were mapped during exploration for oil, and detail work was done over 800 square kilometers.

MALAYA—During the six months ended March 31, 1950, the *Hongkong Tin Company* produced 203 tons of tin-in-ore. The company's dredge was working in higher grade ground and may recoup some of the losses suffered during the year ended last September, during which period the dredge worked tailing for three months and production fell off to only 424 tons of tin concentrate for the year.

INDIA—The *Travancore Titanium Products, Ltd.*, which will manufacture titanium products in India in cooperation

with a British firm, will start production during the year.

AFGHANISTAN—A trial shipment of 250 tons of chrome ore is expected to be sent to the United States by Afghanistan. The rich Logar Valley is estimated to contain from 50,000 to 100,000 tons of high grade ore. The original consignment was for 450 tons; why this was reduced is unknown.

TURKEY—Prospecting and development of chromium deposits found in the province of Mugla in southwestern Turkey are under way. In this section of the country, numerous deposits, both small and large, are being worked.

INDIA—Mineral discoveries in India reported recently include the following: an estimated 10,000,000 tons of limestone in the Kurnool district in Madras; an estimated 3,800,000 tons of selenite near Ran in Navanagar State; and fluorospar occurrences in several parts of the Central Provinces and adjoining states. The last deposits would be of particular value to India, which is importing almost all of her requirements.

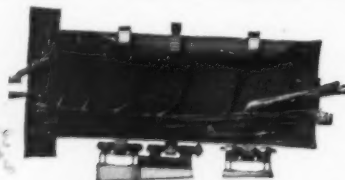


**NORTH AMERICA**

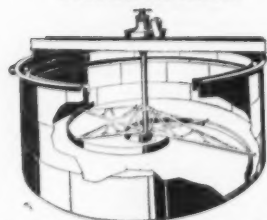
MANITOBA — *Sherritt Gordon Mines Ltd.* is making arrangements to raise about \$29,000,000 over a period of years to bring its Lynn Lake nickel mine into production. The first \$10,000,000 will be acquired partly through a stock sale to shareholders and partly through a stock sale and debenture sale to the *Newmont Mining Corporation* of New York, to cost this company \$8,000,000. Newmont will not be involved in the operation of the property; the company now has, however, one representative on Sherritt's board of directors—P. Malozemoff. At Lynn Lake, total ore reserves at last reports were slightly over 14,000,000 tons. The company has decided to develop a completely integrated operation to produce about 17,000,000 pounds of refined nickel metal yearly, 9,000,000 pounds of copper, 300,000 pounds of cobalt and 70,000 tons of ammonium sulphate fertilizer. Initially, 2,000 tons of ore from the company's two highest grade orebodies (the A and EL) will be treated daily. For a few years the copper concentrates will be treated in a custom smelter, after which a company smelter will be installed. At the A orebody, the shaft will be deepened; at the EL a shaft will be sunk. The company's concentrator, mining plants and employees' houses at Sherridon will be dismantled and moved to Lynn Lake. Power sites on the Laurie River will be developed. The company will ship its nickel concentrate to a refinery which will be built at Alberta and will include an ammonium-sulphate-fertilizer unit. A railway will be built into the Lynn Lake property by the Canadian National Railways. The company estimates that the A and EL orebodies will be ready for mining by the third quarter of 1953. Metal sales contracts call for deliveries to start in 1954.

QUEBEC—Considerable study is being carried out principally by *Golden Mani-*

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**THICKENERS**

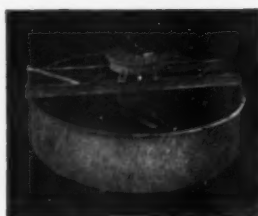


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tou Mines Ltd. and the American Zinc, Lead and Smelting Company regarding the proposal that a zinc refinery be constructed in eastern Canada to reduce shipments to the United States for smelting. Such a smelter would save Canadian shippers up to \$8.00 a ton in shipping costs and would provide some of the by-product sulphuric acid Canada needs. Unfortunately the cost of smelter construction has doubled since the war and smelting charges in a new Canadian plant would undoubtedly run very much higher than U.S. charges. However, the big zinc mining developments in Quebec and Newfoundland, which brought 1950 output to 264,062,472 pounds and may bring 1952 output to 357,000,000 pounds, may overcome all arguments against an eastern Canadian smelter.

OHIO—From Republic Steel Corporation's main offices at Cleveland comes verification of the report that the company wishes permission from the Interstate Commerce Commission to buy an additional stock interest in the Nicholson-Universal Steamship Company in order to control its ore-carrying facilities for the transportation of iron ore on the Great Lakes. Nicholson has purchased three ocean-going carriers and is converting them into ore-carrying vessels of 14,000 ton capacity each for use on the Great Lakes. Republic already has a 50 percent interest in the steamship company.

ONTARIO—Drifting on the seventh level of Campbell Red Lake Mines' property at Red Lake revealed an unexpectedly large gold-bearing orebody about 500 feet from the shaft and the company has now entered the new zone on the fourth, fifth and sixth levels. If present

indications are borne out, about 100,000 tons exist in the orebody with grade averaging a reported \$21.00 per ton. The company recently added five flotation cells to the mill and intends to add six more. Current mill rate is 440 tons daily.

NOVA SCOTIA—Production is to begin late in the year at Mindamar Metals Corporation's new mine in the Sterling district of Richmond County. Initial rate will be 500 tons of zinc-lead-silver-copper ore daily. Dome Mines, Ltd., Mindamar's parent company, plans to advance up to \$1,750,000 to bring the property into production. The mine is opened on six levels, has one two-compartment shaft 600 feet deep, and Dome is sinking another four-compartment shaft 1,000 feet deep. Lateral development is in progress; a mining and milling plant has been ordered; and construction of plant buildings is underway.

WASHINGTON—Pend Oreille Mines & Metals Company spent \$1,121,798 during 1950 for plant expansion and completed all major projects. The company is constructing two additional 800-ton units at the East Mill, both to be in operation at the end of the year at the Metaline Falls property. The second of three huge crushed-ore bins is being constructed, also. It will hold 1,200 tons of ore for feed for the second milling unit. During 1950 the company milled 186,197 tons of ore and produced 11,687 tons of lead and zinc concentrates.

CANADA—The Department of Mines and Technical Surveys is engaged in an extensive geological survey covering all the provinces except Prince Edward Island and expects to have 88 technical parties at work this season.

COLORADO—A lease on 41 mining claims over 800 acres in the Long Park area of Montrose County has been arranged by the Vanadium Corporation of America with the owners, T.C. and Henry Brammeier and associates. According to W. C. Keeley, president of VCA, the lease will provide further uranium-vanadium ore reserves for the operation of the mill at Naturita.

MINNESOTA—Ground-breaking ceremonies were recently held by the Oliver Iron Mining Company at Mountain Iron for a new pilot taconite beneficiation plant with an annual capacity of 500,000 tons of finished concentrates from 2,000,000 tons of hard taconite rock. After beneficiation the concentrates will be agglomerated at Virginia, Minnesota, and the resulting pellets shipped to steel plants

for use in modern blast furnaces.

BRITISH COLUMBIA—Options reportedly have been taken by New York and Toronto men including Joseph Hirschhorn on a uranium prospect in the Kamloops area. The area is to be worked under the direction of Frank Joubin, geologist. Radioactive showings have been found in the old Smuggler Hill mines, and the shafts and adits here will be cleaned out, tested, and rehabilitated.

ONTARIO—Canadian Industries Limited announced it will erect a new plant at Copper Cliff to produce liquid sulphur dioxide from by-product gases obtained from the operation of the oxygen flash-smelting process recently developed by the International Nickel Company of Canada. When in operation the new plant will produce in the neighborhood of 90,000 tons of liquid sulphur dioxide per year. For many years CIL has been producing sulphuric acid from Inco's waste gases; this production also will undergo a major expansion this year. Liquid sulphur dioxide is not at present made in Canada and supplies are obtained from the U.S.A. Because of the high price, consumption has been low. The output of the Copper Cliff plant will help overcome the existing deficiency of elemental sulphur—one ton of sulphur can be replaced by two tons of liquid sulphur dioxide.

TEXAS—A new steel mill will be built at Longview, Texas, by the R. G. LeTourneau Company, which has been granted authorization by the National Production Authority. The mill will have two electric furnaces, a rolling mill of 1,000 tons monthly capacity of 144-inch-wide steel plate, and auxiliary equipment.

UTAH—The Monsanto Chemical Company is said to be studying the feasibility of establishing an atomic power plant in the Rocky Mountain area. The power plant would process phosphate ores and recover uranium for a "breeder" pile.

BRITISH COLUMBIA—In the Slocan silver-lead-zinc district, Kootenay Belle Gold Mines expects to install a mill to handle ore from the Payne, Richmond, Eureka and Ruth Hope properties, recently optioned. The Slocan Charleston Company expects to start production from its Retalack properties. A sink-float mill and tramway will be installed at the Noble Five mine. Golden Slipper Mines Ltd. has acquired several large holdings, comprising a total of 31 claims and including the old Redress, Mercury and



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## INTERNATIONAL

*General Sheridan.* These are said to be promising properties and will be extensively diamond-drilled.

**ARIZONA**—The *Coronado Copper and Zinc Company* at Dragoon has stepped up production from its *Republic* mine to over 5,500 tons of copper-zinc ore

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monthly. The mine crew consists of 110 men, working on a two-shift basis. Both the Johnson shaft, 1,600 feet deep, and the recently completed Moore shaft, 580 feet deep, are active. The ore is concentrated at the company's own mill, with copper concentrates going to the *International Smelter* at Miami, Arizona, and the zinc concentrates to Bartlesville, Oklahoma. Fred E. Gray, Dragoon, is manager.

**ONTARIO**—An agreement for the exploration and development by *Lake Shore Mines, Ltd.*, of the properties of *Kirkland-Hudson Bay Gold Mines, Ltd.* and *Hudson-Rand Gold Mines, Ltd.*, has been signed by directors of the three companies. Lake Shore will pay all development and production costs and is completely in charge. If there is success in finding ore, Lake Shore will receive \$2.00 for every \$1.00 spent in bringing the mine into production. Milling will be done at Lake Shore's mill at no capital cost to the other companies. The deal gives Lake Shore control over a two-mile north-south, one-mile east-west block of promising property in the Kirkland Lake district.

**NEW MEXICO**—F. A. Sitton, Inc., of Dove Creek, Colorado, is considering the erection of a uranium processing plant at Shiprock, New Mexico, the production from which would be purchased by the U. S. Atomic Energy Commission. If it is definitely decided to erect the plant, it

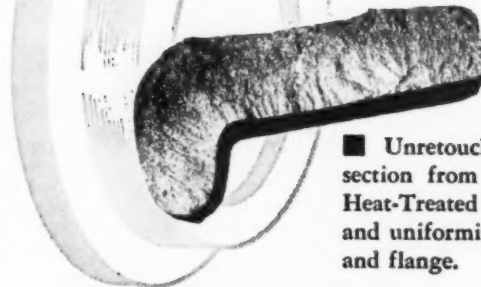
will be necessary for F. A. Sitton, Inc., to lease the land from the Navajo Tribal Council.

**ONTARIO**—*Algoma Ore Properties, Ltd.*'s *Helen* mine is now producing 5,000 tons of iron ore daily. Operations were converted some months ago from openpit to underground methods and mining is by block caving. Last year the mine produced 1,438,000 tons resulting in 1,006,000 tons of premium grade sinter. The company's pyrite property at Goudreau is becoming more important, because of the world sulphur shortage; diamond drilling has proved several million tons of ore and other orebodies have yet to be investigated.

**BRITISH COLUMBIA**—The *Eden, Crescent* and *Krao* mines in the Nelson area are being rehabilitated for production this month by *Yale Lead and Zinc Mines*. The company expects to increase mill rate then to full capacity of 250 tons daily. The company holds 30 properties in the Ainsworth district, of which the *Highlander* mine is the principal producer.

**NORTHWEST TERRITORIES**—A joint-exploration project for further investigation of a nickel-copper deposit on the shore of Rankin Inlet, 300 miles north of Fort Churchill on Hudson's Bay, has been arranged by *Cyril Knight Prospecting Company*, owner of the property, *Coniagas Mines* and others. A new company has been formed, called *Rankin Inlet Nickel Mines*, to explore the deposit.

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*resist wear so much longer?*

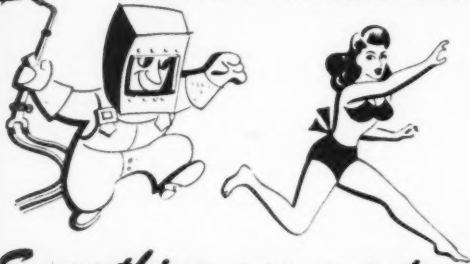


■ Unretouched photo of rim section from a card Semi-Steel Heat-Treated wheel. Note depth and uniformity of chill in tread and flange.

The job of improving and controlling the metallurgy of Card Wheels never stops. They are close-grained, strong, tough, and excel in wear resistance. Years of cost-cutting service in hundreds of mines prove it!

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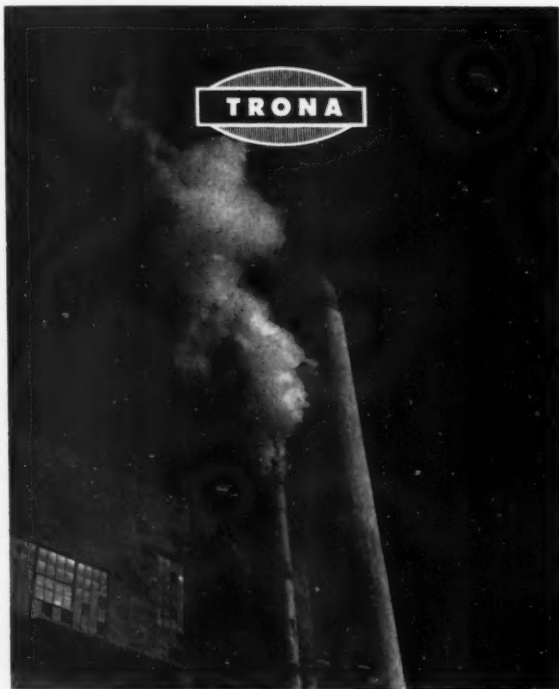
Elmco Corporation  
34 South 4th West Street  
Salt Lake City, Utah

Western Machinery Company  
760 Folsom Street  
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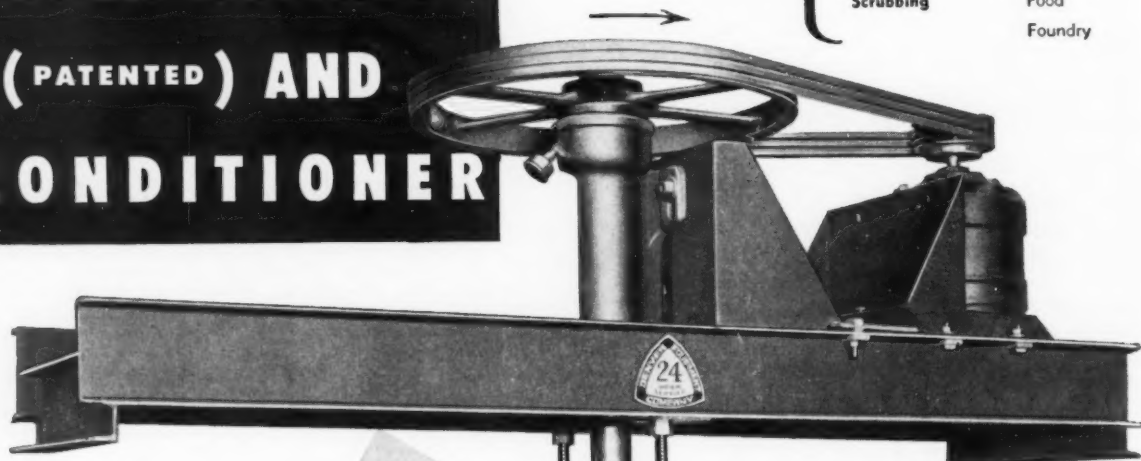


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FOR TOUGH  
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Scrubbing

Mining  
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## EVERY PARTICLE MIXES

Feed normally enters directly into the standpipe top . . . is sucked down and is positively mixed by the propeller at the lower end. Thus, there can be **no** short circuiting of pulp as every particle is thoroughly agitated and mixed.

## EVERY PARTICLE RECIRCULATES

Pulp movement in the tank is constantly toward the adjustable central standpipe due to the sucking and mixing action of the propeller and the resulting controlled vortex down the standpipe. Intermediate recirculation ports may be opened or closed depending on the treatment process.

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A feed port is available directly to the lower end of the standpipe. Since discharge is at a higher point, an actual gain in elevation can be had for series applications.

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For intermittent operation or between shifts, there is no problem of "digging out" as the replaceable alloy iron standpipe flange prevents "sanding in" of the propeller.

SIZES 3' x 3' to 20' x 20'

Write for Deco Bulletin A2-B2, containing detailed information and pulp density charts for calculating size required.



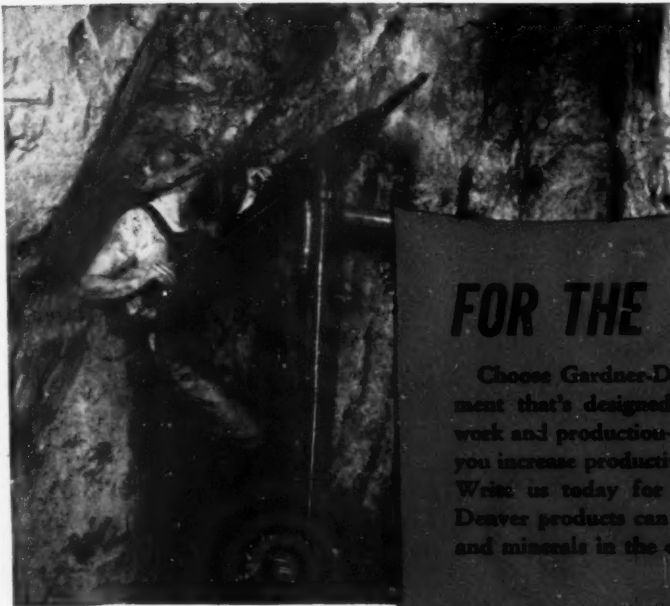
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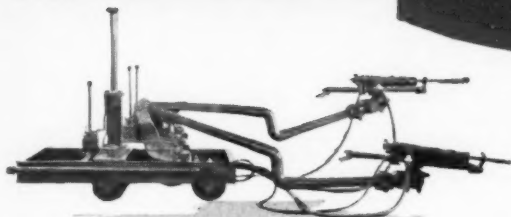
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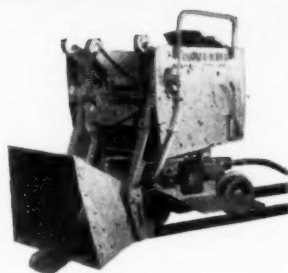


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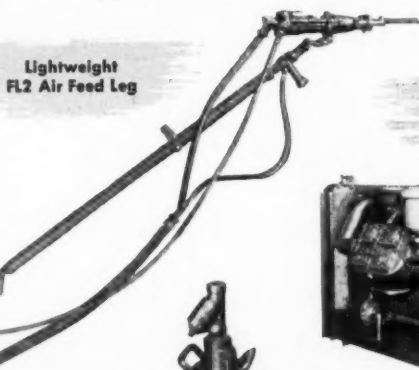
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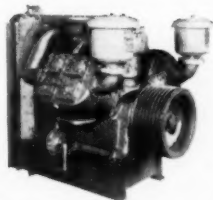
Hard-Hitting Sinkers in every Weight Class



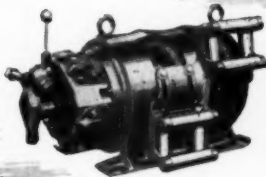
Lightweight FL2 Air Feed Leg



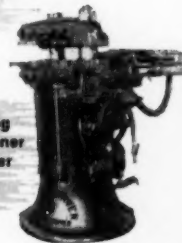
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JULY, 1951

[World Mining Section—37]

61

## International Smelting and Refining Co.



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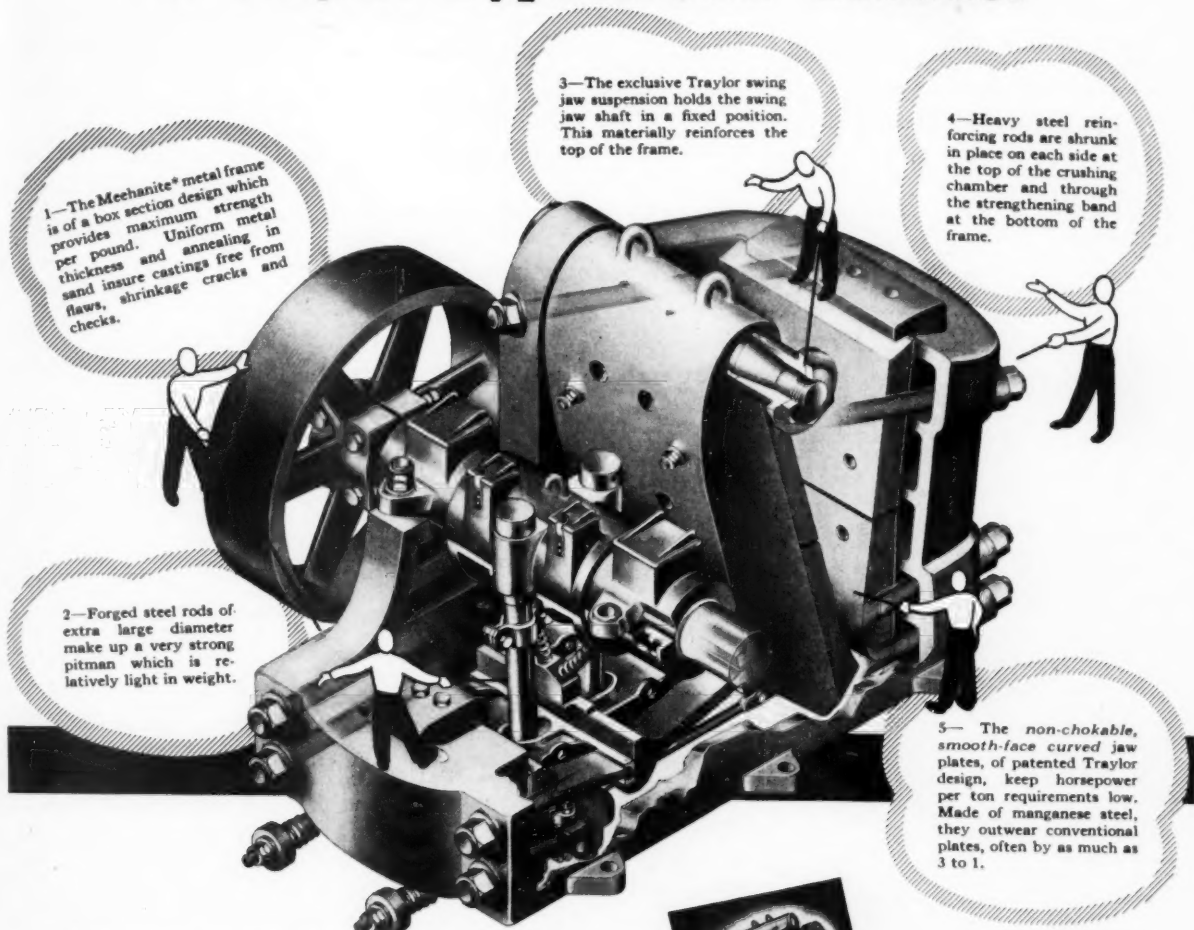
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# "Advanced Design" is written all over a Traylor Type R Jaw Crusher



1—The Meehanite® metal frame is of a box section design which provides maximum strength per pound. Uniform metal thickness and annealing in sand insure castings free from flaws, shrinkage cracks and checks.

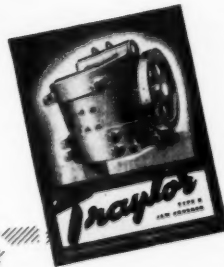
2—Forged steel rods of extra large diameter make up a very strong pitman which is relatively light in weight.

3—The exclusive Traylor swing jaw suspension holds the swing jaw shaft in a fixed position. This materially reinforces the top of the frame.

4—Heavy steel reinforcing rods are shrunk in place on each side at the top of the crushing chamber and through the strengthening band at the bottom of the frame.

5—The non-chokable, smooth-face curved jaw plates, of patented Traylor design, keep horsepower per ton requirements low. Made of manganese steel, they outwear conventional plates, often by as much as 3 to 1.

This cut-a-way illustration of a Traylor Type R Jaw Crusher exposes its many advanced design features. Each of these many features contribute to larger profits by increasing production while cutting power and maintenance costs. The Traylor Type R Crusher is a modern breaker of massive proportions and sturdy construction . . . designed for heavy-duty service under the most severe operating conditions. For more complete information on one of the best primary crushers available, mail coupon for free bulletin on a Traylor Type R Jaw Crusher.



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# PRODUCTION EQUIPMENT PREVIEW

PEP is just what new equipment, increased mechanization, and new methods can give to your mine, mill, or smelter. This PEP section is MINING WORLD's way of making available to you some of the finest current information on mechanization.

## FREE-LITERATURE PREVIEW

To get any item of free literature illustrated or described in the Production Equipment Preview, note the key number of that item, circle the corresponding number on the PEP coupon, and mail it to Mining World, 121 Second St., San Francisco 5, Calif.

**URANIUM TEST KIT:** A pocket-sized test kit that enables positive identification of radioactive ore is now available from Menlo Research Laboratory. For further information on the kit, which consists of chemicals, blow torch, fire tablets, bead wires and tongs, circle 8.

**ABRASION AND CORROSION-RESISTANT LINING:** Cast-basalt tiles in flat, curved, or custom shapes, and in a variety of sizes to fit almost any application, have a Moh hardness of 8 to 9 and thus are extremely abrasion resistant; they are nearly impervious to corrosive materials. Publication CB-1 by H. Windsor & Company, Ltd. describes use of cast basalt for flumes, ash races, chutes, cyclones, dust extractors, pipe linings, flooring and many other uses. Circle 9.

**FILTER FABRIC:** Woven of virgin wool and a new synthetic fiber, Dynel, FUME-ALL is available in tailor-made bags, yardage, and filter shapes. Lasting "3 times as long with a moisture absorbency 50% less than conventional wool fabrics," FUMEALL fabrics are available in 5 standard weights. For further information, write or telephone Portland Woolen Mills, Inc., Portland 3, Oregon, or circle PEP No. 12.

**SLUSHING PRODUCTS, BIT KNOCKER:** A new 12-page bulletin describes Alloy Steel & Metals Co.'s complete line of Pacific products for scraper mining: the new Slushmaster scraper available in sizes from 26 to 60 inches, the Round-the-Corner sheave block, a variety of sheave blocks and anchors, and also the Bit Knocker for removal of single-use bits. Circle 13.

**REAR-DUMP EUCLIDS:** A 16-page catalog covering Models 31TD and 53TD Rear-Dump Euclids of 44,000 lb. payload capacity has been published by Euclid Road Machinery Co. Circle No. 16 for Form No. 120.

**FINE CRUSHER:** A new 32-page booklet describes and gives virtually all necessary engineering data for choice of and installation of Allis-Chalmers' Hydrocone crushers. For your copy of the new booklet, which describes crushers ranging from a small Hydrocone which crushes 1" rock to 3/4" to the large unit which crushes 11" rock to 1", circle No. 19.

**EQUIPMENT REPAIRING:** Stulz-Sickles Co.'s latest edition of the "Mangal Marketer" is devoted to methods of repairing worn dipper teeth by the use of special Mangal wedge bars. Circle 21 for your copy.

**FLEXIBLE VENTILATION TUBING:** An informative new 12-page booklet gives detailed information on the installation and use of Bemis Bro. Bag Co.'s Flexipipe for use in ventilating coal mines, metal mines, and tunnels. Circle 22.

**RIPPERS, DOZERS, GRADE BUILDERS:** Baker Manufacturing Company's Bulletin 894 is an 8-page, 2-color booklet which describes and gives specifications of the "3 new actors for your A-C tractors," Baker Root Rippers, Bulldozers, and Grade Builders for use on the HD-5, HD-9, HD-15, and HD-20. Circle 23 for your copy.

**COAL FLOTATION:** Method of Denver "Sub-A" (Lasseter Type) cell application by Philadelphia & Reading Coal Co. to recover anthracite coal fines, a paper by H. R. Hagen. Copies obtainable from MINING WORLD or from Denver Equipment Co., Denver, Colo. Circle No. 26.

**CRUSHER:** A new bulletin with a mechanical tack-in not only illustrates but also demonstrates the "crushing-without-rubbing" action of the Kue-Ken jaw crusher, manufactured by Straub Mfg. Co. Circle No. 32.

**CLAMSHELL MAINTENANCE:** A new 42-page booklet issued by Blaw-Knox Co. describes the care and maintenance of clamshell buckets. Owners and operators of cranes or hoists equipped with a clamshell will get a copy of this informative work by circling 33.

**RECTIFIER:** The Westinghouse Ignitron rectifier is a mercury-arc unit with high efficiency in the low-voltage range; available in a wide range of outputs and sizes, it is non-rotating, brushless, simple to install, and provides positive control of output voltage. Circle 34.

**HOLE SAVER:** If you've broken a steel in drilling lately and have lost the bit, you'll be interested in Rock Bit Sales & Service Co.'s new Hole Saver, described in a new 4-page folder. Circle 35.

**TRAMP-IRON REMOVER:** A new 16-page catalog, "Non-Electric Permanent Magnetic Separators for Tramp Iron Removal," available from Eriez Manufacturing Co., is a complete work on permanent magnets, and the engineering of their application. Circle No. 38.

**CYLINDERS:** Ledeen Mfg. Co., Los Angeles, Calif., manufactures compact cylinders for operation of chute gates, cherry pickers, and for numerous other push-or-pull applications in the mineral industry. Designed for air, water, or oil operation, available for medium, special, and super duties in a wide variety of sizes, Ledeen

cylinders and the mountings to adapt them to special uses are described in Bulletin 500. Circle 42.

**PIT MINING:** A new 6-page, two-color folder released by the International Harvester Company describes "High Production, Low Costs . . . With International Pit and Quarry Power. Form A-317-NN is yours by circling No. 50.

**PROSPECTOR MILL:** Postwar improvements of the Gibson Prospector Mill, available in 2-, 5-, and 10-ton sizes for prospecting and milling of free-gold ores, are described in "Bulletin F, The Gibson Prospector Mills." Circle 57.

**LARGE PORTABLE AIR COMPRESSOR:** Revolutionary new Ingersoll-Rand unit, weighing only 9,500 lbs. and delivering 600 cfm. free air at 100 psi. Literature available, or by writing Ingersoll-Rand, 11 Broadway, N.Y.C., or by circling 61.

**DUST AND FUME CONTROL:** A new periodical devoted to the latest developments in industrial dust and fume control, has just been published by American Wheelabrator & Equipment Corp. For a copy of "Industrial Ventilation" circle No. 62.

**EARTH-MOVING:** Proper zoning of heavy earth-moving equipment, with a resulting increase in both production and profit, is described in "Caterpillar Equipment Zoned for Profit." Circle 63.

**HYDROSEAL PUMP:** Allen-Sherman-Hoff Company's catalogue No. 451 contains valuable data and tables for Engineered Long Distance Pumping. Methods and graphs are used to calculate the pump required. The solution of such a problem for a specific pumping job is given in great detail. Data contained in the tables are for two to 12-inch suction and discharges for A, AB, B, BC, C, CD, and D frame Hydroseal pumps. A copy of the bulletin may be obtained by circling No. 65 on the PEP coupon.

## Heavy-Media Plant To Sample Diamonds

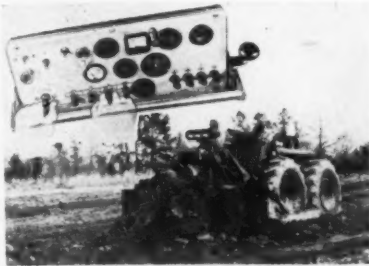
A Heavy-Media Separation Plant to separate diamonds in Tanganyika, East Africa was recently ordered from the Western Machinery Company in San Francisco. Williamson Diamonds, Ltd. of Tanganyika will use this specially designed prefabricated plant to handle 2 tons per hour of 3/4" to 16-mesh diamond-bearing ore on a sampling basis. Heavy-Media Separation will segregate 1 per cent sink material.

The new, small size Heavy-Media plant will use a 30"x24" Wemco Drum Separator. Recently added to Western Machinery Company's regular line, this small plant is expected to prove useful in other types of small scale mills and in pilot operations.

## Tornadozer Available With Torque Converter

R. G. LeTourneau, Inc., is now building the Super C Tornadozer, available with torque converter and electric control.

The torque converter is a single-stage



type, which acts as an automatic hydraulic transmission, combining the advantages of a hydraulic torque converter and a hydraulic coupling. It transmits and selects the proper ratio for delivering power in a steady, even flow to the wheels and provides a shock load cushion between the engine and the drive wheels which allows the engine to operate at maximum rpm. Lugging of the engine is eliminated. This provides maximum torque when needed (particularly when starting), and permits smooth acceleration to all speed ranges, which cuts down tire slippage and wear. This single stage torque converter was selected because it delivers its greatest operating efficiency in a range closely matched to the speed ratios of the Tournamatic constant mesh transmission now used on current equipment. Circle No. 93.

## Tunneling Machine Speeds Up Tunnel Driving

A new tunneling machine has been developed to speed up tunnel driving. The Demo-Canon Engineering and Manufacturing Company, Los Angeles, California, has developed the new Demo Automatic Gang Drill using Tilden Konkrete Kore type tungsten carbide bits.

The new gang drill will work the entire face of a tunnel in a single operation to a depth of 10 feet. The present machine has a face suitable for driving a tunnel in rock 6' 9" wide, with an arched roof having a total height of 7' 6". As now set for work, the machine is well adapted for ordinary mining purposes. The same type machine can be made to drive tunnels of other sizes and shapes.

The operator is located in a fully protected, enclosed cab where all the driving controls are conveniently arranged on a console. Beyond the control panel are located the power plant, gear boxes, compressor units and other integrated components of the machine. The present model has 28 drills. Outside rows of drills are adjustable and may be moved in vertical or horizontal directions to give a pitch variation of 4½" in 10 feet from direction of drive. All other drills are in fixed position, parallel to direction of drive. 15 outside drills and 13 fixed drills.

Circle No. 91.

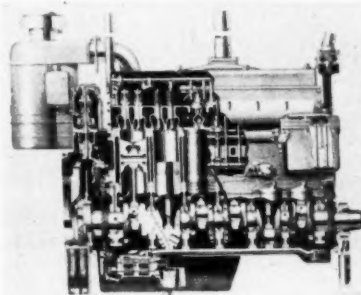
## Allspeed Drive Provides Wide Range of Speeds

A compact series of new variable-speed transmissions is now available from Worthington Pump and Machinery Cor-

poration. The Allspeed Drive, in six sizes from 1 to 15 hp., uses tandem belts as the coupling between in-line input and output shafts in an arrangement which provides a smooth, stepless, precise speed adjustment during uninterrupted operation. Ideal for powering feeders, machine tools, and other variable speed apparatus, the Allspeed allows stepless control at 1725 rpm. input from 215 to 3450 rpm. for 1-hp. models, and from 370 to 2220 rpm. for 15-hp. models. Get your free file of "Worthington Allspeed Drive Data" by circling 85.

## New Caterpillar Diesels Available Soon

Two new Caterpillar Diesel engines, the D337 and D326, will be in production sometime mid-year in 1951. The D337 (cutaway view below) is an industrial version of the six-cylinder engine developed for the DW20 and DW21 tractors.



New features include mounting of fuel pumps adjacent to cylinders they serve, pistons cooled by an oil-spray from a nozzle attached to the block, and fine filtration of all engine oil. The D337 is rated for continuous duty at 170 hp and 1,600 rpm; the D326 is rated for continuous duty at 118 hp. and 1,600 rpm. For further information on these two new engines, circle 94.

## HD-20 Tractor Features 3-Stage Torque Conv.

The new Allis-Chalmers HD-20 uses power from a new 2-cycle GM 6-110 diesel transmitted by a three-stage torque converter which eliminates most gear shifting and still keeps the tractor work-

ing smoothly at higher-than-average speeds. Designed for rugged use and maximum operator efficiency, the HD-20 is Allis-Chalmers' new entry into the big tractor field. It features a positive-grease-seal packing for wheels, idlers, and rollers which require greasing attention only once every 1,000 hours.

Get further information on this heavy-duty tractor for pit and surface work by circling No. 86.

## New Mine Communication System Uses FM Radio

General Electric announces the availability of a 6-volt FM transmitter-receiver radio system for installation in mines. The equipment, which includes power supply and control and tuning units, provides two-way voice communication between the mine station and a locomotive, two mine stations, or two locomotives operating on a common line.

The new radio, built for rugged use in mines, utilizes a loud-speaker calling system and a telephone-type handset for communication. For further information which may help to control underground traffic, circle 90.

## Pullman Delivers First TD-24 Hydraulic Dozers

The first of five TD-24 hydraulic dozers built by Pullman-Standard Car Manufacturing Co. since acquisition of the Isaacson Iron Works road equipment di-



vision in Seattle is shown being shipped from Pullman's Hammond, Ind., plant. Tractors are shipped from International Harvester's nearby Melrose Park, Ill., plant to Hammond, where Pullman-Standard attaches the hydraulic dozers and then ships the assembled diggers to the customers.

### PEP Editor

July '51

### MINING WORLD-WORLD MINING

Please send me complete and free information on the following equipment described in your PEP section, and keyed by the numbers I have circled:

→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CIRCLE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
NUMBERS	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
YOU	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
DESIRE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Also send further free information on the equipment advertised on page:

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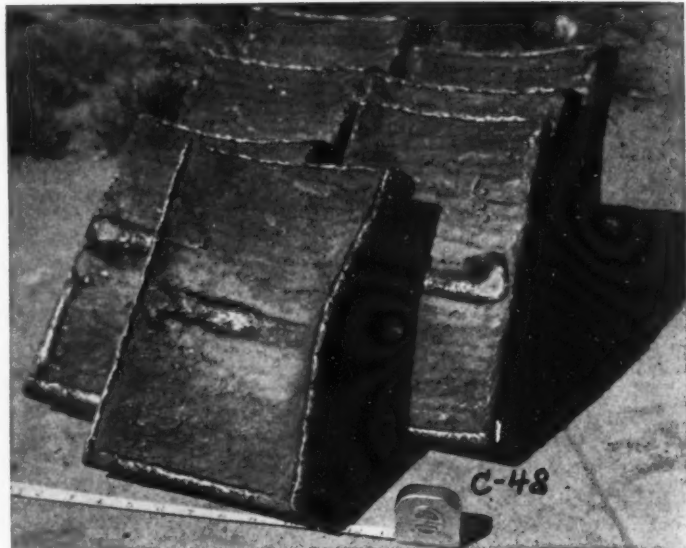


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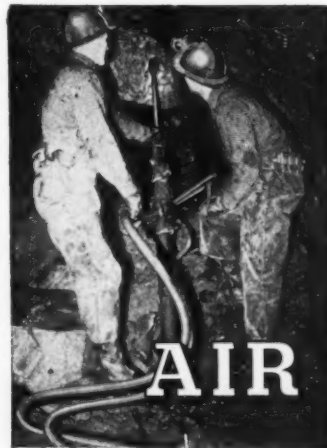


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## precipitates—ROCKY MOUNTAIN

### Combined Metals Plans Exploration at Bauer

The application of the Combined Metals Reduction Company, Salt Lake City, Utah, to the Defense Minerals Administration for exploration funds for its Bauer mine in the Stockton district, Tooele County, Utah, has been approved, according to E. H. Snyder, company president.

The exploration project calls for the driving of 5,000 feet of drifts and crosscuts to explore in depth the continuation of lead-zinc orebodies mined in the shallow workings of the Ben Harrison mine. Exploration work will be started from the 1,200-foot level of the company's Bauer mine and is estimated to cost \$200,000. One half of the cost of the project will be for company account and the other half for government account under the terms of the regulations issued by Interior Secretary Oscar Chapman for mineral exploration.

### Carbonero Mine at Ophir Bought by Silver Bell

The Silver Bell Mines Company, operator of the Silver Bell mine and 150-ton-per-day mill at Ophir Loop, Colorado, has purchased and will operate the Carbonero mine at Ophir. Underground mining at the Carbonero was last conducted in 1929 by Carlo Girardi and Martin Anderson of Telluride, Colorado. In 1936 dumps and tailing were shipped to Tooele, Utah, for smelting.

The mine is developed through a 1,800-foot crosscut adit. High-grade silver-lead-gold ore has been mined from the narrow Panama vein in the Telluride conglomerate, San Juan tuff and Silver-ton volcanic rocks. The 50-ton mill in the Ophir valley is connected to the ore bins at the adit portal by a 2,200-foot-long aerial tram.

E. H. Sanders, Silver Bell president, maintains general offices at 701 U. S. Na-

tional Bank Bldg., Denver. A. A. Smith, superintendent, headquarters at Ophir Loop. Clifford Wilfley of Denver is consulting engineer.



The Climax Molybdenum Company, Climax, Lake County, Colorado, the world's largest molybdenum and United States' largest tin producer, has received a Defense Production Administration certificate for accelerated tax amortization. The certificate for \$9,273,800 was 75 percent certified and will facilitate increased production of molybdenum, tungsten and tin.

The Silver Shield Mining and Milling Company's 250-ton-per-day flotation mill at Ouray, Ouray County, Colorado, has been completed, according to L. E. Stein, president and general manager. Phil Page has been in charge of mill construction. Ore for the mill is to be furnished under contract by the Wanakah Colorado Leasing Company from the Wanakah mine. The leasing company has completed a road survey and started construction of a new road from the mine to the mill.

The Colorado Standard Lead-Zinc Mines, Inc., a subsidiary of the Lucky Tiger Combination Gold Mining Company, will begin ore production this year, according to J. B. Kassebaum, Lucky Tiger president. The company has expended \$189,000 to rehabilitate, develop and bring the Ute and Ulay mine on Henson Creek, Hinsdale County, Colorado, into production. The repaired differential-flotation mill will produce a silver-lead concentrate and a zinc concentrate.

The United Gold Mines Company has reopened its Vindicator mine in the Cripple Creek district, Teller County, Colo-

rado, according to Al Beebe, Jr., Vindicator superintendent. Underground mining will be confined to lessee operations for the present and four of them are now making shipments of gold ore to the Carlton mill of the Golden Cycle Corporation.

The Climax Uranium Company, operator of uranium-vanadium mines in Colorado and Utah and a treatment plant at Grand Junction, Colorado, has received two certificates for accelerated tax amortization from the Defense Production Administration. One certificate covers ore mining at Outlaw and Calamity Mesas, Colorado, and at the Cactus Rat claims, Grand County, Utah. The amount applied for was \$173,699 and it was declared eligible for a 90 percent certification. In a second certificate, \$909,023 was applied for and \$908,194 declared eligible with a 90 percent certification. This amount covers uranium oxide production at the Grand Junction plant.

The Lupton Mining Company continued the driving of a lower adit beneath the workings of its Grizzly mine in the Argentine district, Clear Creek County, Colorado, during the past winter. High grade lead-zinc-silver ore has been mined from the upper workings and shipped to the company's Commonwealth mill at Georgetown for treatment. The company has filed an application with the DMA for financial assistance so as to speed up exploration of its mining properties. Major Ellis P. Lupton of Georgetown is president of the company.



The U. S. Atomic Energy Commission has started a prospecting diamond drilling program at the mining claims of the Western Gold Mines, Inc., in the Silver Reef district, Washington County, Utah

## HETZER MINES, INC.'S., WOLF TONGUE MILL TREATING FERBERITE ORE

The Wolf Tongue mill of Hetzer Mines, Inc. at Nederland, Boulder County, Colorado, is treating newly mined ore, dumps and stope fill from the company's mines and also is treating small lots of custom ore. Most of the ferberite (F.WO.) ore is from the Hoosier, Illinois, Cross and Cold Springs mines and the Prospect tunnel. Negotiations with DMA have been underway to increase mill capacity to 100 tons per day if a suitable crude ore-buying program can be established in the district. Elmer Hetzer, long time Boulder County miner, is president of Hetzer mines, which purchased all the properties of the Wolf Tongue Mining Company in 1948.



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according to Ralph G. Brown, Western Gold's president. The Silver Reef mine has been a producer of silver-copper-sandstone ore, but recent discoveries of copper-uranium ores in the district have switched interest to them. Lessees on company claims are mining uranium ore and shipping it to the Salt Lake City plant of the Vitro Chemical Company for processing.

The East Utah Mining Company, a subsidiary of the New Park Mining Company, has outlined an exploration program at its property in the East Park City district, Summit County, Utah. The plan calls for drifting on the McHenry fissure from the Newmont tunnel, and a winze will be sunk on the fissure if any mineralization is found by drifting. Exploration of a water-filled fissure disclosed by diamond drilling from the General Connor branch of the tunnel is also planned. The operations will be directed by New Park's staff. An application for DMA assistance to cover half of the exploration costs has been filed.

A body of zinc-lead-silver ore in porphyry has been found between the 1500 and 1700 levels in the Ontario section of Park Utah Consolidated Mines Company's properties at Park City, Utah, according to Paul H. Hunt, vice president of Park Utah. The orebody was found while raising a shaft between the 1600 and 1500 levels to be used for hoisting ore mined from three limestone replacement orebodies in the area. The company is continuing an active exploration and development program, and at least half of the mine crew is occupied by this work.

The Mineral Hills Uranium Company is stripping a surface area on its Fullmer group of uranium claims in the Marysvale district, Piute County, Utah. The company has also leased its Mineral Hill claims to the Ancient Channels Gold Mining Company, which is now driving a tunnel to prospect an area below an old glory hole in which uranium mineralization recently was found. Adrain W. Cannon of Salt Lake City is president of Mineral Hills.

Two uranium-producing districts of San Juan County, Utah, are the scene of roadbuilding activity. In the Jacobs Chair district, Ozro Hunt is building roads for M. Duncan. Hunt is also building new roads and repairing others in the Red Canyon district.

The Magnolia Lead and Oil Company is shipping its stockpile of uranium ore to the Vitro Chemical Company's Salt Lake City plant. The ore is produced at the company's openpit mines in the Sinbad district, Emery County, Utah. The carnotite ore is mined after about six-feet of overburden is stripped off. Shipments of ore will be speeded-up following completion of the new road the company is building. Kenneth C. Griffiths is secretary-treasurer of Magnolia.



The Continental Sulphur and Phosphate Corporation, Cody, Wyoming, has applied for and received an eligibility rating in the amount of \$1,850,000 for a plant. Accelerated amortization was allowed on 85 percent of this amount.

**MINING WORLD**



## precipitates—NORTHWEST

### ASARCO Plans 1,000-Ton Mill at Van Stone

A concentrator with 1,000 tons daily capacity may be built by the American Smelting & Refining Company at the Van Stone zinc-lead mine east of Colville, Washington. Plant construction will start before the end of the year; if proper arrangements can be made, a power transmission line will be built to the mine.

Drilling of the main Van Stone property has been nearly completed and some prospecting of adjacent claims optioned to ASARCO is under way. Four diamond drills are presently in operation.

D. J. Pope, with offices in Salt Lake City, is general manager of the company's Western Mining Department; P. A. Lewis is resident engineer and Victor Hollister, resident geologist at the Van Stone property.

### Hecla Acquires More Mullan-Area Claims

Through the recent acquisition of three different groups of mining claims, Hecla Mining Company now has an interest in a string of properties extending eight and a half miles along the east silver belt south of Mullan, Idaho, and easterly into Montana.

Besides Hecla's recently reported option on the Atlas Mining Company property, a 10-year exploration and development lease and option-to-buy has been taken on 67 claims owned by the East Silver Belt Lead Mines, extending west from Atlas holdings to the Rock Creek Mining Company ground—which is 95 percent controlled by Hecla. And another 10-year option has been taken on 15 claims owned by the Greenough family, seven of which claims join Atlas ground on the west and eight of which join it on the east. These claims include the New York group, A-Z group, and St. Regis or Border group. Roger Greenough,

one of the owners of these properties, also is president of Atlas.

Newmont Mining Corporation and New Jersey Zinc Company, which are partners with Hecla in the Atlas development, and will put about \$1,000,000 into it, may acquire a 25 percent interest in the development of the surrounding claims if or when contract terms are carried out there. As the area, except for Atlas workings, is relatively untouched, a large, new, productive district may come into being.

### American Zinc Installs New Hoist at Grandview

American Zinc, Lead and Smelting Company, Metaline Falls, Washington, is installing a new hoist on the surface at the Grandview mine. The 200 hp. unit with hoisting speed of 600 fpm. will replace the present 75 hp. hoist (an underground installation) which hoists at 250 fpm. Current production of 800 tons of ore daily from the new 300-foot level will be better maintained by the larger hoist, according to H. F. Mills, general superintendent.

A 60-foot inclined shaft, through which the new hoist will operate, has been completed from the underground hoist room to the surface. A 24 by 24 foot prefabricated steel hoisthouse is being erected.

Grandview operations provide work for about 140 men and 35 more could be put to work, if available.

At American Zinc's Lead Hill property in the Slate Creek area north of Metaline Falls, reports of new ore discoveries have been received. The company has been doing extensive exploration at the property for several years, and during 1950 several thousand feet of bulldozing was said to have been completed as well as several hundred feet of tunnelling and exploratory diamond drilling.



A fourth electric furnace unit to manufacture elemental phosphorus will be built by the Westvaco Chemical Division of the Food Machinery and Chemical Corporation at Pocatello, Idaho. The company also is planning to expand existing facilities for processing phosphorus into various grades.

New Rainbow Mining Company has leased and will develop the Weber mine on the east side of Pend Oreille Lake, Idaho. Robert H. Austin of Spokane, a Rainbow director, holds the lease and will retain surface rights. The company will rehabilitate the lower workings from which some silver-lead-zinc ore was taken years ago. The surface of the Weber has been open-pit-mined for several years by lessees, who have made regular shipments. New Rainbow had been exploring a property at Medimont, Idaho.

Recent ore discoveries have been made by the Highland-Surprise Consolidated Mining Company, Hypotheek Mining and Milling Company, Coeur d'Alene Mines Corporation and Silver Summit Mining Company, all in the Kellogg-Wallace, Idaho, area. Highland made a lead-zinc strike on its 1450-foot level, the deepest. The oreshoot, said to be the downward extension of the No. 2 Surprise vein, measured from three to seven feet wide, according to Robert D. O'Brien, mine superintendent. Hypotheek has encountered ore in the face of its 900 level southeast crosscut. This opening is the old 900 east drift. Ore has reached a 30-inch width. Coeur d'Alene Mines, while driving an exploratory crosscut on the 2800-foot level in southwesterly workings, cut a six-foot-wide showing of silver-copper ore. Previous diamond-

## MINES MANAGEMENT RECEIVES DMA LOAN E-1 FOR IROQUOIS MINE

The United States Government has agreed to furnish \$12,000 to Mines Management, Inc., Spokane, Washington, for exploration at its Iroquois lead-zinc mine in Stevens County, Washington, under provision of the Defense Production Act of 1950. Mines Management will match Federal funds dollar-for-dollar for diamond drilling to explore for extensions of orebodies adjacent to, above and below the mine workings. Both surface and underground holes are scheduled in the 2,800 feet of hole to be drilled. W. Randolph Green, president of Mines Management, has ordered two drills to operate 24 hours a day until the project is completed. R. S. Williams, mine engineer, and P. E. Oscarson, geologist laid out the drilling program. Pictured here is a general view of the buildings at the portal of the Iroquois mine.



drilling had indicated only a three-foot width. Crosscutting has been continued through the vein to explore for parallel structures. Silver Summit found ore in the west drift on the 3000 level. The silver-copper showing was over a width of 14 inches.

About six weeks ago, *Idaho Goldfields, Inc.*, resumed development of its property east of the Fourth of July Canyon ridge between Coeur d'Alene and Kellogg, Idaho. A new tunnel site has been bulldozed and 75 feet of tunneling will be done to get under a lead vein found cropping out last winter. Another five-foot sulphide vein has been found on the surface. The company has completed all building construction and machinery installation and is in a position to pursue an intensive development program this

year. W. M. Fredericks is president and Ed Oerhling is superintendent.

*Merger Mines Corporation* has ended the agreement with *Silver Summit Mining Company* for deep development by the latter of Merger ground. Contract terms provided for cancellation if no work was carried out for 18 months' time. The agreement may be re-negotiated later on, however, when *Polaris Mining Company* begins exploration of the Silver Summit vein on the latter's 3000 level; the vein enters Merger ground a short distance beyond the point of proposed exploration.

In order to expand operations the *Delemer Mining and Recovery Company* of Spokane is offering 500,000 shares for sale to raise \$125,000. The company wants to increase mill capacity, buy more mine

machinery, and do additional exploration and development. The property is near Harpster, northeast of Grangeville, Idaho. The mill was recently connected to the Washington Water Power Company's electrical distribution system. Officials of Delemer are Arthur E. Daniels, president; Roy A. Daniels, vice president; and Larry L. Lincoln, secretary-treasurer.

A new assay office has been opened by Lloyd E. Broadhurst of Salt Lake City, Utah, at 1025 South Broadway, Boise, Idaho. The Broadhurst mining interests lie chiefly in Ada and Gem Counties, and Jack Taylor, superintendent for Broadhurst in Gem County, has been named superintendent of the new assay and metallurgical business. Both private and custom work will be done. Director will be T. C. Butler, Jr., of Boise, and chief metallurgist will be Royal Eubanks, assisted by William Spain, a University of Idaho graduate in mining.

The *Paymaster* mine, 30 miles west of Arco, Idaho, has been acquired by *Spokane-Idaho Mining Company*, according to Frank N. Marr, president. The Paymaster company has retained a 25 percent interest in any net profits from the property, and Spokane-Idaho has acquired all mining and milling equipment and will complete a lower crosscut to the Paymaster vein and its exploration. A new corporation will be set up to handle the operation. The Paymaster property was located late in the 1800's and consists of 25 claims. During World War II it produced about 20,000 tons of zinc-lead ore from surface outcroppings and from the upper tunnel.

*Bunker Hill and Sullivan Mining and Concentrating Company* has set aside 19,000 acres of land as tree farms in order to supply the 6,000,000 to 10,000,000 board feet of mine timber used each year by the company. The farms are in the Bear, Pine and Latour Creek areas of the Coeur d'Alene region. The company plans to plant between 25,000 and 50,000 trees a year. Another report about the company states it has been granted a 320-acre quartz lease in Shoshone County, Idaho, the plans for which are unknown.

*Silver Bowl, Inc.*, which has an option to lease the *Bobby Anderson* group of 16 claims from *Nancy Lee Mines, Inc.*, has a diamond drilling program in progress under the direction of Stephen Zoldok, geologist. Vivian Brothers of Kellogg, Idaho, are doing the surface drilling. The Bobby Anderson claims are on the lower end of Pine Creek. Last year about 2,000 tons of lead-zinc ore was shipped from shallow upper workings by lessees. The original operators, who opened the mine about 20 years ago, drove a creek-level adit about 1,300 feet in length and sank an inclined shaft about 100 feet. Silver Bowl has a lease on the nearby *Amy-Matchless* mill and will use it to treat any ore taken from Bobby claims.

*Sidney Mining Company* bought the Idaho First National Bank Building at Kellogg, Idaho, and moved into its new quarters May 1. W. T. Simons, president of the mining company, said the company had long been pressed for adequate space. The bank moved into a new building in March.

Work by *Day Mines, Inc.*, at the *Heracles* mine near Burke, Idaho, has explored the orebody over a vertical length of more than 400 feet. The ore structure has been followed about 630 feet westerly and some ore has been disclosed. The company recently completed installation



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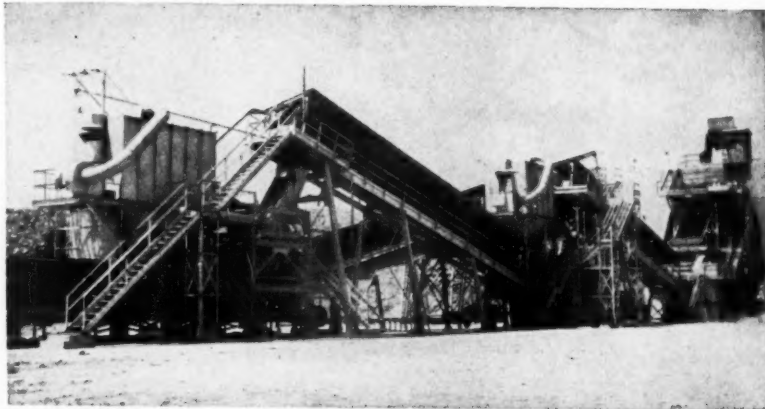
*Swansea Mines, Inc.*, is now developing the *Kleinschmidt* mine, acquired from the *Minmont Company* and located near *Winston*, *Broadwater County*, *Montana*. *Swansea* expects to have the mine, which contains lead-zinc-copper-gold-silver, in production in August. In 1947 a 2,000-foot crosscut in lower workings was completed to cut a vein 3,350 feet from the portal. In upper workings of the mine the vein had yielded several carloads of ore, which was shipped 28 miles to *Asarco's* *East Helena* smelter. However, since values in lead and zinc were nearly even, zinc was lost in smelting and the shipments were discontinued until a mill could be installed. *Swansea* will do about 600 feet of drifting on the lower level and will drive a 700-foot raise to upper workings. When sufficient drifting has been done to assure a steady tonnage for a mill, the company will move its mill at the *Carbonate* mine near *Lincoln* in *Lewis* and *Clark County* to the *Kleinschmidt*. During development high-grade ore will be shipped, as it is nearly free of zinc; low-grade will be stock-piled. The *Kleinschmidt* is equipped with heavy rail in all workings, electric power, compressor, and locomotive, among other facilities. *Swansea* is also doing development work at its *Silver Bell* property near *Lincoln* but is concentrating on getting the *Kleinschmidt* into production first. *C. L. Hewitt* of *Helena* is president and general manager.

*Sunlight Mining Company* has started shipping part of a 20,000-ton order of phosphate rock from an unnamed buyer. The phosphate is being mined from the company's *Moonlight* property near *Maxville*, *Montana*, according to *Wellman Clark*, secretary-treasurer, *Spokane*. He also advised that *Sunlight* had received a bid for another 100,000-ton lot. The mine, formerly a lead-silver producer, has an estimated 42,000 tons of phosphate above the tunnel level, 537,000 tons on the level and possibly as much as 4,000,000 tons at a depth of 1,000 feet below the tunnel level.

The *Zonolite Company*, which mines vermiculite ore at *Libby*, *Montana*, recently shipped 11 carloads comprising 550 tons from *Libby* to *New Orleans*, *Louisiana*, from which point the shipment was loaded on the *S.S. Sue Lykes* consigned to *C. Gartenmann and Company*, *Zonolite* licensee, at *Berne*, *Switzerland*. *Zonolite* mines vermiculite in *South Carolina* also and has licensed plants throughout the world which process and sell the insulating material.

*Anaconda Copper Mining Company* is progressing with construction of surface facilities and mine preparation for the *Greater Butte Project* to recover low-grade copper ore. Old workings in mined-out sections of the *Butte* district are being filled with tailing and about 2,000,000 tons of filling has been emplaced. Enlargement and concrete-lining of the *Kelley Shaft*, which will handle the 6,000 tons of ore per day to be mined

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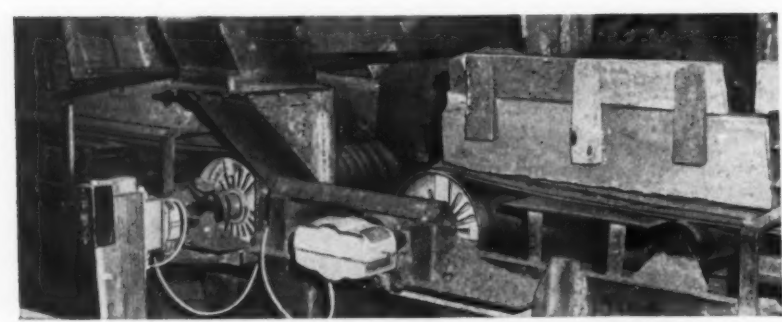
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initially when the Project is in operation, is to continue throughout the year. The main hoist house at the Kelley Shaft site and facilities, including a 7,500-ton steel railroad ore bin, are completely installed. Work is proceeding on the 600 and 1,300 main haulage levels of the Project and mining is scheduled for 1952. By 1953 the company expects to be mining 10,000 tons of ore daily and eventually 15,000 tons. Remodeling of four sections of the copper concentrator at Anaconda for the treatment of Project ores is underway, with two sections completed and the other two scheduled for completion at the end of the year.



The Bonanza quicksilver mine has resumed operations at Sutherlin, Douglas County, Oregon. The mine closed in December, 1949, when prices dropped so low. Now, under the supervision of Burt Avery, 25 men are employed on a two-shift basis. Underground exploration work as well as stoping is under way.



A log ore-bin is being constructed by the Columbia Lead & Zinc Mining Company at its property south of Z Canyon in Washington's Metaline district. Capacity of the ore-bin is 1,500 tons.

Goldfield Consolidated Mines Company made a net profit last year of \$49,313 on its various operations, including the Deep Creek and Anderson lead-zinc properties in Stevens County, Washington. The company is now buying the royalty interest retained by the owners when the property was acquired. Goldfield last year organized the American Chrome Company to take over a long-term lease on the Mouat chrome property near Nye, Montana, and retains a 66 percent interest in this company.

The second of three crushed-ore bins is now being constructed at the new milling plant at Bend Oreille Mines and Metals Company north of Metaline Falls, Washington, and will hold a 1,200-ton supply of ore for the second milling unit being installed in the plant. The company's recently issued annual report showed an income of \$41,950 for 1950, an earned surplus of \$271,649 and current assets of \$1,168,980. Liabilities were \$168,696.

Pacific Northwest Alloys, which is operating the government-owned magnesium plant at Mead, Washington, also will operate the government's dolomite plant at Marble, employing 30 men. The plant is now being rehabilitated by the Morrison-Knudsen Company.

Headquarters of the Tri-County Mining Association are being moved from Wilbur to Grand Coulee, Washington, according to Clare A. Gray of Spokane, president. The association was said to have signed up 100 new members in Grand Coulee recently.

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### OLIVER IRON COMPANY BREAKS GROUND FOR PILOT TACONITE BENEFICIATION PLANT

To tap the vast reserves of low grade iron ore (taconite) on the Mesabi range, Oliver Iron Mining Company, subsidiary of the United States Steel Corporation, broke ground at Mountain Iron, Minnesota, on May 17 for a pilot taconite beneficiation plant with an annual capacity of 500,000 tons of finished concentrates. About 250 guests watched R. T. Elstad, president of Oliver, turn over the first spadeful of earth, after which excavation work started immediately. The plant will probably begin operating in the summer of 1952.

Mr. Elstad said, "The plans disclosed today contemplate further steps in United States Steel's long range program of research, development and construction in the field of domestic iron ore beneficiation, and exploration and development of foreign sources of ore, both of which are needed for our nation's economic growth and security in time of war."

Oliver began basic research in the beneficiation of magnetic and non-magnetic taconites about eight years ago when a research laboratory was set up at Duluth, he explained further. As a result of the work there, the company embarked on a taconite development program of three stages.

The first stage was intensive drilling of taconite formations to determine "the characteristics of the material, which are extremely variable." The design of the pilot plant and its machinery hinges directly on those findings. During two years of drilling, crews bored about

65,000 feet of diamond-drill holes. After studying 12 miles of drill core, the company chose Mountain Iron as the most suitable place for pilot plant operation.

The second stage of the work is the construction of the plant to separate fine particles of iron from rock by crushing it four times, grinding it twice, and then extracting the fine magnetic iron particles from waste materials by magnetic separators.

The third stage will be agglomeration to form the pellets used in blast furnace charges to produce iron. To work out the complex problems of agglomeration, Oliver began construction of an experimental taconite agglomerating plant last year at Virginia, Minnesota.

Further details of the second stage of the work include the development of an openpit taconite mine, which will be equipped with various drills (rock, churn, jet-piercing, and the new quarry-master drills), power shovels, and rail haulage with diesel locomotives; the building of shops and offices; and the setting up of a water system, power lines and substations, waste dumps and other allied facilities.

The new plant will operate the year around and will produce 500,000 tons of iron concentrates yearly from about 2,000,000 tons of hard taconite rock. (The general ratio of magnetic to nonmagnetic iron in taconite in the area is from 70 to 90 percent). The concentrates will be sent to the Virginia agglomerating plant to be pelletized and then will be shipped

by rail and ore carrier to steel plants at the lower lakes for testing in modern blast furnaces. Depending on the successful use of the pellets in blast furnaces, much larger, commercial-sized plants may be built, involving very large investments. But before such plants become realities, "taconite agglomerates will have to meet the competition of ores from other domestic and foreign sources."

### Minerva Oil Leases Lead-Zinc Claims Near Joplin

Gil Montgomery and L. P. Pressler of the Minerva Oil Company have taken over the lease on 1,100 acres of land 11 miles northwest of Joplin, Missouri, from L. W. Goings of Joplin. The U. S. Bureau of Mines has been doing geophysical testing on the land for some time and has authorized an \$18,000 drilling program for the tract, according to reports. Montgomery and Pressler have one drill rig in operation now.

The mines in the tract were heavy producers of lead and zinc ores in the early 1900's. One mine, the Peacock, was worked for several years as an openpit and a mill is located on this property. There are several old shafts developing the properties.



The Crane Company, Chicago, Illinois, applied to the Defense Production Administration for \$162,500 for facilities to produce titanium metal. The company was reported eligible for that amount with 90 percent certified. Other recent DPA authorizations have gone to such companies as the Great Lakes Steel Corporation, Judson Steel Corporation, Youngstown Sheet and Tube Company, Lukens Steel Company, Republic Steel Corporation and Detroit Tube & Steel Division of Sharon Steel Corporation. The combined expansion projects of these companies will cost more than \$60,000,000.

One of the most recent and largest independent underground operations in the Tri-State district is being carried on at the Huttig mine, now operated by Worley, Madison, and Williams, three local mining men. Last October they leased 410 acres of land about four miles southwest of Baxter Springs, Kansas, including the Huttig mine, for many years a high-tonnage producer of zinc and lead ores. Since January the mine has been completely equipped with modern machinery. The orebody is 240 feet deep, and about 450 tons of material is bulldozed from drifts in two eight-hour shifts and delivered to a high loader. The high loader elevates the ore to a truck which takes it to the top of a hopper at the shaft where it is dumped. At the bottom of the hopper there is a short double track

R. T. Elstad, president of Oliver Iron Mining Company, removes the first shovel-full of earth in ground-breaking ceremonies for the company's pilot taconite beneficiation plant to be built near Mountain Iron, Minnesota. Among company officials and guests looking on are J. E. Mechamer, vice president-operations; W. L. Maxson, vice president-research; and W. J. Kaiser, superintendent of the eastern division.





which handles the cans on small cars coming and going from the shaft, a few feet away. This part of the operation is practically automatic, the hooker directing the cans to and from the hopper and rope, and is so rapid that one fast hooker can hook about 100 cans per hour. The company is operating under lease the Brewster mill, four miles northwest of the mine; it has a capacity of about 30 tons per hour and is operated on a 12-hour shift, at present. As development progresses, the company plans to run the mill on a 24-hour basis with no more than two shifts in the mine.

The Aper Mining and Smelting Company of Chicago, Illinois, has announced that it will not locate a proposed multi-million-dollar aluminum plant in Arkansas, having shelved expansion plans for the present.

The Arkansas Economic Council, State Chamber of Commerce, Associated Industries of Arkansas and University of Arkansas, having made a joint authorization of \$35,000 for further studies of mineral deposits in the state.

Expansion plans have been announced by the Granite City Steel Company at a cost of \$35,000,000 at Granite City, Illinois, and by the Crucible Steel Company of America at a cost of \$27,250,000 at Midland, Pennsylvania. Granite City will add a third blast furnace to the recently acquired Koppers Company pig iron and coke plant, plus coke ovens, sintering facilities, a power house and other equipment. Capacity of the plant will be increased 900 gross tons daily. Crucible will construct a new blast furnace, enlarge open hearth and electric furnaces and install a battery of coke ovens among other additions.



An additional 3,400 acres of timber land near Morgantown, Berks County, Pennsylvania, have been bought by an affiliate of the Bethlehem Steel Company. The company already holds 1,750 acres at Morgantown which are iron-bearing. The new land was bought from William Phelps and includes the Joanna furnace, which has been idle for a century.

The U. S. Atomic Energy Commission has selected the National Lead Company as contract-operator of the Commission's Feed Materials Production Center to be built near Cincinnati, Ohio, according to Wilbur E. Kelley, manager of AEC's New York Operations office. The Center is to be built on a 1,200-acre site near the Miami River, northwest of Cincinnati and will include a uranium ore refinery. The Catalytic Construction Company is designing the plant and the George A. Fuller Company is construction contractor. The permanent operating force for the Center, when completed, will be about 1,200. Joseph A. Martino, president of National Lead, said his company would give the Center top priority in his company's activities.

U.S. Steel Corporation's subsidiary, the Consolidated Western Steel Corporation at Orange, Texas, is turning out more than 52,000,000 pounds of fabricated steel for the Kaiser Aluminum and Chemical Corporation's new aluminum plant being built near New Orleans, Louisiana. The

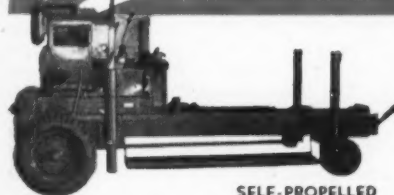
Kaiser plant will be the third largest primary aluminum plant in the U.S. and the fourth largest in the world, when finished. It will produce 200,000,000 pounds of aluminum pig annually. Consolidated's schedule calls for completion of shop work by December 1.

The International Minerals & Chemical Corporation will hold a special stockholders meeting on June 21 to consider several proposals, particularly the possible acquisition of Innis, Spenden & Company, a potash chemical company, which operates a manufacturing plant at Niagara Falls, New York, a refining and processing plant at Jersey City, New Jersey, and a warehouse at Chicago, Illinois. Innis, Spenden was founded in 1816 and is primarily concerned with the manufacture, refining and processing of caustic potash, carbonated potash, chlorine and chlorinated minerals and chemicals, and industrial waxes and gums. Its business would form a natural basis for further expansion of International Minerals in the chemical field, according to Louis Ware, president.



Additional concentrating equipment will be installed at the Buckeye mine, Coleraine, Minnesota, by the Hanna Iron Ore Company, according to reports. The plant, to be installed beside the present washing and heavy-density plant at the mine, will treat minus-3/4-inch ore. The Hanna-operated Butler Brothers is also building

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a plant to recover and retreat fine tailing at the Patrick mine, Cooley.

Foundations are being poured for a heavy-duty processing plant at the Cleveland-Cliffs Iron Company's Holman-Cliffs mine, Taconite, Minnesota. The plant is being built beside an existing plant.

The W. S. Moore Company of Duluth is stripping the Judson mine near Buhl, Minnesota, where an estimated 257,000 tons of ore is available. Total stripping required will be about 450,000 cubic yards. The company is installing a crusher to handle Judson ore. The mine is a Minnesota state lease.

Inter-State Iron Company has installed a battery of 50 Humphreys spirals at the

Grant mine, Buhl, Minnesota, to treat about 300,000 tons of tailing accumulated since 1945. About 70,000 tons of concentrates will be recovered.

April shipments of iron ore from upper lake ports amounted to 6,231,674 tons, or nearly 6,000,000 more tons than in April 1950, when lake shipping was so late opening. Shipments during the week ended May 21 amounted to 2,931,154 tons; season shipments by that date amounted to 14,354,631 tons.

The M. A. Hanna Company has ordered two new ore carriers of 30,000 tons capacity each from English shipbuilders for delivery in 1955, according to George M. Humphrey, president. Ore mined at the company's Labrador-Quebec operation

will be picked up by the carriers at Seven Islands, Quebec, and carried to Montreal, Philadelphia and Baltimore.

The Jackson Iron Company's Bradley openpit and the Globe Iron Company's Globe-Cornell pit, both at Iron Mountain, Michigan, and both silicious iron ore properties, are the only iron ore properties now operating in Dickinson County, once one of the busiest iron mining regions. Both mines are shipping this season.

The M. A. Hanna Company has built a screening and crushing plant at its Wakefield mine at Wakefield, Michigan, which has been idle for some years. The plant will handle the large stockpiles of low grade ore which were built up during the mine's active shipping years. A belt conveyor carries the ore from the new plant to the old shaft house pocket for loading into railroad cars. Trial shipments have begun at the rate of 750 tons of ore daily, which is mixed with ore from Hanna mines in the Iron River district on an experimental basis. The company also has announced through S. E. Quayle, general superintendent of Michigan mines, that a pilot plant will be constructed for the beneficiation of low grade iron ore three miles east of Randville, near the Groveland mine. The plant will be the first of its kind in the upper peninsula. The process involved will be similar to that used on taconite. Other Michigan activities include the unwatering of the Tully mine at Stambaugh (The Bengel mine and the Tully will be a joint operation) and shipping from the Wau-seca mine at Iron River. During the winter, ore was shipped from the Wauseca direct from shaft pocket to furnaces to keep pace with demands of steel companies.

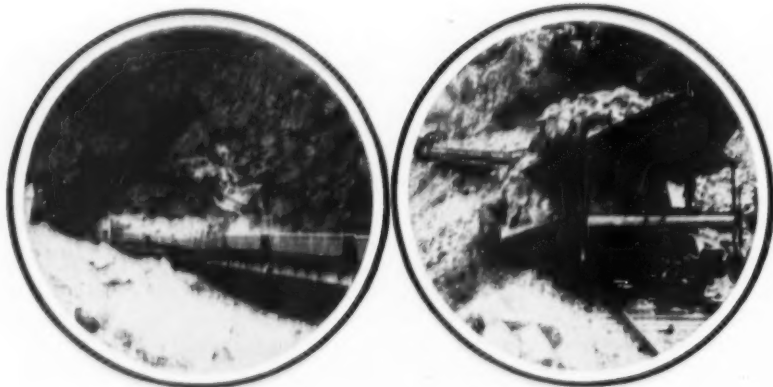
At Inland Steel Company's Bristol mine, Crystal Falls, Michigan, a 1,400-foot, 36-inch-wide belt conveyor is being installed on the 12th level to bring ore from the mine workings to the hoisting shaft. At the company's Cayia mine a timber head-frame is being erected and shaft sinking will begin soon.

The Wisconsin-Michigan Power Company, to meet the heavy demands for electric power at Michigan mines, is building three hydro-electric power plants at Iron River, adding to a sub-station at Crystal Falls and building a new power line to Inland Steel Company's new Cayia mine east of Crystal Falls.

The Youngstown Sheet & Tube Company has been buying from 20,000 to 25,000 tons of Brazilian iron ore monthly for open hearths in the company's plants at Indiana Harbor. The ore is high grade lump and is being used experimentally for open hearth charges.

At a mining symposium held at Hibbing, Minnesota, recently, the U. S. Bureau of Mines advised that 12 holes totaling more than 2,300 feet were drilled on an iron sulfide deposit about 15 miles southeast of Atkin last year when the sulphur shortage began threatening the country. As results of the work so far done are inconclusive, the Bureau will resume drilling this summer on the northeast portion of a magnetic trend. Another announcement made at the symposium by Walter E. Lewis chief of the Bureau's Region V Minerals Survey Branch was that the 500,000,000 tons of low grade iron material in Minnesota's Cuyuna Range contains 10,000,000 to 24,000,000 tons of metallic manganese.

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### Crews Set Drift Record in Magma 4600 Footwall

A drifting crew at Magma Copper Company, Superior, Arizona, has established a local record in the driving of the eight by eight-foot west-footwall drift along the main vein on the 4600 level. Crews of four men (lead man, miner, mucking-machine operator, and mucker), working two shifts for six days per week, have advanced an average distance of 60 to 65 feet per week. Lead men on the drifting crews are Mike Katich and Volly Wilson.

Driving equipment consists of these units: One trolley locomotive pulling a string of 10 two-ton A-Bottom ore cars; one 3½-inch drifter mounted on a screw column; one-inch round steel in changes to six feet tipped with detachable cross bits; one mechanical shovel loading muck at the face; and one Magma-fabricated car changer kept at a minimum distance of 150 feet from the face.

Magma's car changer was designed by Night Foreman Wait Chafey; it allows for shifting an empty car sideways on a special dolly so that a train can pass by the empty. To accomplish car shifting, the motorman stops his train with an empty on the car changer, shifts the empty aside, runs forward to the face to pick up a newly loaded car, and then retreats behind the empty. A mucker then shifts the empty back onto the track and trams it in to the face.

### Taylor-Knapp Building Mn Plant Near Tracy

The Taylor-Knapp Company, producer of battery-grade manganese at Philipsburg, Montana, has opened a California division with headquarters at Tracy. The company is building a five-story milling plant four miles south of Tracy beside the Western Pacific Railroad. Initially, manganese ore from the Ladd mine on

the P. J. Connolly ranch six miles from the mill in San Joaquin County will provide mill feed. Before the Tracy project began, Taylor-Knapp tested several carloads of Ladd ore at its Montana plant with satisfactory results. The Tracy mill will house a magnetic concentrator and will use both wet- and dry-milling processes. Plant construction is under C. F. Knaebel's supervision; A. V. Taylor is general manager.

Mining will begin this month, initially by openpit methods at an eventual rate of about 100 tons per day. About four men will be employed at the mine and about 10 at the mill. By 1952 the company hopes to have its flow-sheet sufficiently adjusted to be able to accept custom ores from the area.

### Production of Tungsten Planned in Bagdad Area

E. G. Green, mill superintendent of Bagdad Copper Corporation and general superintendent of Hillside Mining & Milling Company, has leased the Tungstona mine, three and a half miles up Boulder Creek from Hillside, Arizona, and is now preparing the mine for production. The orebody of the Tungstona is a steeply dipping vein, approximately 15 feet wide, consisting of wolframite-quartz stringers in granite. Across its width, the Tungstona vein averages 0.25 to 0.40 percent WO<sub>3</sub>. Though previous production has been small, the mine has been developed by a new adit which will enable substantial production. Preliminary tests indicate that the low-grade ore can be beneficiated to 2 to 3 percent in a WEMCO Mobil-Mill, and can then be concentrated to specification in a simple gravity plant.

In the nearby Eureka mining district, Edgar A. "Ed" Scholz and J. H. "Jim" Cazier, general superintendent of Bagdad Copper Corporation, have leased the Black Pearl Mine, which, as Jim says, "is now

108 miles by jeep from Bagdad but only 11 miles in a straight line." The partners are planning to build seven miles of road to enable them to haul 16 miles to the Hillside mill. The Black Pearl vein, nearly vertical, 4 feet wide, and consisting of wolframite, quartz and pyrite is developed by 550 feet of adit and is now being prepared for cut-and-fill stoping. Past production indicates a tenor of about 0.75 percent across the 4-foot width.

Hillside Mining and Milling Company is now building, as an extension of its present facilities, a custom mill for treatment of wolframites from the Tungstona, the Black Pearl, and other properties in the Hillside-Bagdad area.

The mill will include a WEMCO Mobil-Mill which will beneficiate a large tonnage (500 to 1500 tons) of low grade ore into approximately 100 tons of medium-grade sink product. A conventional gravity plant of 200 tons capacity will treat the HMS sink and will have additional capacity for 100 tons of higher grade ore; the gravity section will include crushing and grinding equipment with concentration by jigging and tabling.

### Combined Metals Plans to Explore Prince Claims

Combined Metals Reduction Company, Pioche, Nevada, has obtained a lease on Prince Consolidated Mining Company's properties in the Ely and Highland districts of Lincoln County, Nevada, and has agreed to do about 4,000 feet of drifting and crosscutting. Exploration will be started from Combined Metals property and extend into Prince ground in a search for lead-zinc-silver ore.

According to E. H. Snyder, president of Combined Metals, exploration costs will be paid for as much as possible from any mining profit made from Prince property. When these costs are paid, Combined Metals stockholders will re-

## IDAHO-MARYLAND SINKS WINZE BELOW 2700 LEVEL ON 6 FOOT VEIN

The picture shows one of the Idaho-Maryland Mines Corporation's new lightweight Atlas Diesel drills and the six-foot vein on which the No. 60 winze is being sunk below the IM 2700 level. The spot shown in the picture is 275 feet below the collar of this winze. The drill is one of 20 recently installed in this big Grass Valley, California, mine. These drills use Swedish Cormorant drill steel and are proving highly satisfactory. The winze is being sunk to connect with a long crosscut from the Brunswick shaft on the latter's 3280 level. This work is in a new and virgin area of the mine and gives promise of extending that big gold producer's productive days another 15 or 20 years. Albert (Bert) Crase is president in charge of mining operations for the MacBoyle-Oliver management. The miner shown in the photo is Ben Jean.







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Robins Mine Conveyor you get not only the best elements—machinery and belt—that your money can buy; you also get the satisfaction and peace of mind that come from having one unified source guaranteeing successful performance.

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ceive two-thirds of further profits and Prince stockholders one-third.

Prince holds about 12 patented and 12 unpatented mining claims and 1,000 acres of patented ground in the county. About 78 percent of the company's stock is jointly held by Combined Metals, Anaconda Copper Mining Company, and David Gemmill and Sons of Pasadena, California.

**ARIZONA**

Arthur Still and Alfred Wandke of *Southwestern Geological Service* are sinking an exploratory shaft near Humboldt, Arizona, for the *Golden Crown Mining Company*. Daniel B. Harper is in charge of the actual sinking and 16 men are employed for the job. The shaft will have one and a half compartments.

A new company, *United Mines Company*, Chloride, Arizona, has been formed, has leased several mining properties and is starting immediate development. Included in the claims are the *Evahom* group of 13 claims, *Little Tennessee*, and the *Scotch Lassie* group of three claims. Development has been started at the *Little Tennessee* on a lead vein and at the *Scotch Lassie*, where a strike recently was made of gold-silver-zinc ore. A compressor house, head frame and hoist house have been installed here. A mill probably will be built on one of the properties in time. Officers of the new company are M. B. Maxwell of Carlin, Nevada, president; Dr. J. P. Irish of Spokane, Washington, vice president; and C. L. Lind of Chloride, secretary-treasurer.

The *Apache Asbestos Company* reports discovering an 18-inch vein of high-grade asbestos on its property 49 miles northeast of Globe, Arizona. Louis Rayes, president, was said to be planning to expand operations on the strength of the strike, and the working force will be increased gradually from five to about 25 men. If the showing does not peter out, the company will consider building a mill.

Now in the last phases of its stripping contract with the *Ray Mines Division of Kennecott Copper Corporation*, Ray, Arizona, the *Isbell Construction Company* of Reno, Nevada, is mining 8,500 tons of ore daily from the Ray pit and is stripping about 1,125,000 tons monthly. Later this year, when stripping has advanced to the point where the stripping-to-ore ratio is normal, Kennecott will take over the entire mining operation. Heavy drilling, loading, and haulage equipment, which will be used in the mining, will soon be arriving at Ray.

The *Acme Mining and Development Company*, headed by Frank Maddock, president, Box 49, Ruby Star Route, Tucson, Arizona, is developing the *Mary G.* claim in the Cerro Colorado district of Pima County. The shaft has been sunk to a depth of 40 feet and a head frame and hoisting equipment are being installed. D. B. Chester is superintendent.

A small openpit development has been started by the *E. M. M. Mining and Development Company* at the *Antelope* mine. Ore values are in lead and silver. The company officers are: Frank McCargar, president, 1223 North Norton, Tucson;

R. McBarnes, secretary; and H. C. Ertel, manager, both of Tucson, Arizona.

**Grove and Sons Mining Company**, 202 North Pleasant Street, Prescott, Arizona, has a small crew engaged in development work at the *Oro Flame* mine, a group of 11 claims in the Hassayampa mining district of Yavapai County. Ore values are in gold, silver and lead. Five men are employed. A. S. Brown, 837 North Avenue 67, Los Angeles, California, is president of the company.

The **Emperor-Duchess Mines Company, Inc.**, is milling copper-silver ore at Sells, Arizona, from its mines in the Papago Indian Reservation. Myrl Green of Sells is in charge of operations. Ben Lasswell, of Fairfield, Idaho, is president of the company.



**Buckman, Inc.**, chemical manufacturing firm of Memphis, Tennessee, which recently bought the *Contact* quicksilver mine in Sonoma County, California, has now arranged an operating agreement with Frank Dewey of the *Dewey* mine near The Geysers, Sonoma County. The Dewey will be developed to supply mercury for the Memphis plant. The mine is equipped with a 20-ton-capacity rotary furnace, and the 50-ton rotary furnace now at the *Contact* is to be moved to the Dewey mine later on. Development of the Dewey is under way; diamond drilling in its Big Red workings disclosed ore at a 19-foot depth; a four by six-foot 32° inclined shaft has been sunk 40 feet and encountered ore most of the way. Surface bulldozing also has disclosed intermittent showings. Buckman's engineer, Charles Hubbard, has been supervising preliminary work.

In Madera County, David D. Baker of Bishop and Reno, and his associates in Fresno Mining Company, are preparing to open the *Strawberry* tungsten mine, which is 35 miles north of Bass Lake and 85 miles from Madera by road. Underground development is under way. The property is equipped with a gravity concentration plant and crushing unit.

The Defense Production Administration has granted a certificate of necessity to the **American Smelting & Refining Company**, Selby, California. The company was eligible for \$2,254,000 for slab zinc and lead bullion with 60 percent certified.

The **Gold Bar Mining Company** is working one shift at its mine north of Alta-ville, Calaveras County, California. The shaft is down 370 feet on the Central Hill Channel.

At Fontana, California, **Kaiser Steel Corporation's** eighth open hearth furnace began operations late in May with the charging of materials for the first 225-ton "heat" of steel. The new open hearth will raise Kaiser Steel's rated capacity to 1,380,000 tons of ingots annually, an increase of 15 percent over the previous annual ingot capacity of 1,200,000 tons.

Surface manganese mining is being carried on by H. E. Nolan and M. Reilly, and underground manganese mining by Fred Buck and Charles O. Gorman at adjoining deposits in southeastern Nevada County, California, according to reports. Buck and Gorman were said to be shipping a carload weekly to Geneva Steel's Utah plant. In Plumas County,

**Lakeriew Manganese Mines**, formerly known as the **Western Manganese Mines**, is reopening Miles Timmons' property at Crescent Mills, closed since World War II, and expects to start shipping manganese ore in July. An adit is being driven under the direction of O. H. Griggs, who is the head of **Alhambra Gold Mines Corporation** at Kelsey, and who is also preparing, under the name **Star Mines**, to resume production from a manganese property owned by John Sobrero in the Crescent Mills district.

Several old quicksilver mines are being rehabilitated and reopened in California. In Sonoma County, the **Culber Baer** mine's Oakland workings are being opened by Carl Baumeister and a crew of five men. In a canyon adjoining the Oakland workings Baumeister has found a silica-carbonate ledge carrying cinnabar. He has two men engaged using a bulldozer to prepare this section of the property for mining. Enough ore is estimated to be available to start running the rotary furnace about one week per month. In the same county, Vincent Harrison is using a crusher, rolls, trommel, concentrating table and rotary concentrator on ore from the *Eureka* mine. In Lake County, four men are doing underground diamond drilling at the *Abbott* mines to try and locate an extension of an orebody discovered during a surface diamond drilling program in 1946. Work is proceeding from a 1,200-foot drift. Also in Lake County, A. and J. Garcia, T. Marino and J. Kinsela of Middletown, are retorting dump ore from James Creek, the material consisting of unfurnaced ore washed down the creek from the old *Out Hill* mine's rotary furnace. A. Garcia also is dismantling the old *Knox* furnace near Mirabel Springs and then will start clean-up operations from ground at the furnace site.

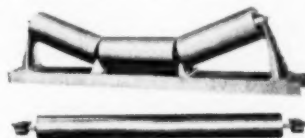
The **Bradley Mining Company**, 425 Crocker Building, San Francisco 4, California, has three men at work at its *Reed* mercury mine in the Knoxville district, 25 miles northwest of Monticello, Yolo county, California. The mine was acquired in 1939 and was last operated in 1945 by the Bradley Company. The men at the mine are currently engaged in a cleanup and rehabilitation program. Worthem Bradley is president of the company. Phil W. Cox is superintendent at the mine.

The first shipment of iron ore reportedly has been made from the *Iron Age* mine east of Twentynine Palms, California, of which Fred A. Storey of Yucca Valley is owner. The company is said to have a contract for 250,000 tons from a Japanese firm. Storey and his partners have Gibbons and Reed of Salt Lake City under contract to mine the ore, with B. C. Andrews in charge. The company is installing a crusher and other machinery at the mine and a road is being completed from the mine to the Amboy road. At Amboy ore will be loaded on the Atchison, Topeka and Santa Fe Railway.

The Defense Production Administration has advised that the **Titanium Metals Corporation of America** applied for \$14,162,840 to use for the production of titanium metal at Henderson, Nevada. The

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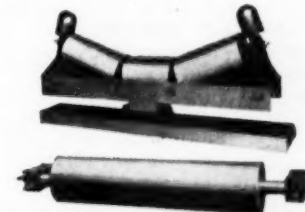
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## HEWITT-ROBINS IDLERS

company was eligible for the entire amount with 90 percent certified.

The McNeil Construction Company has been awarded a \$1,000,000 contract by the Western Electrochemical Company for initial expansion of its facilities at the Basic Magnesium Plant, Henderson, Nevada. Western Electro plans to spend a total of \$10,000,000 over a period of several years for expansion. The McNeil company also has a \$2,500,000 contract at the Basic Plant to put *Manganese, Inc.*'s plant into operating shape. Another company, the McNeil Contracting Company, reportedly has a \$700,000 contract to build a new operations base for the U. S. Atomic Energy Commission near Indian Springs.

Further plans have been reported for the mining and milling of Nevada tungsten. The *Winnemucca Mountain Mines Company* is said to be planning construction of a tungsten processing unit in the Rye Patch district near Winnemucca. The company will convert its existing pilot mill to a 50-ton capacity tungsten plant. The *Donovan* gold mill at Silver City is

to be converted to process tungsten ores mined by the *Canadian-American Tungsten Company* from its openpit east of Gardnerville. The mill will have a 100 to 150-ton-per-day capacity. The 100-ton-daily *Consolidated Virginia Mining Company* mill at Virginia City has been leased by Fred Vollmer of Silver Peak to treat tungsten ore from his mine in the Pyramid Lake region. The *Black Rock Mining Company* of Bishop, California, which is opening up the Lincoln tungsten mine in the Tem Piute region of Lincoln County, may build a mill at the mine. Twelve men are working at the mine under the supervision of W. F. Elgin.

As a result of the Eureka County, Nevada, Commissioners agreeing to build a mine road southeast from Beowawe to Frenchie Creek in the Cortez Range, iron mining plans of several firms and individuals are closer to realization. The property consists of Sections 22, 23, 25, 26, 27, 34, and 35, Twp. 29 N., Rge. 50 E., MDM in Eureka County, contain at least 15 known iron deposits, and are owned by *Iron King Adventures, Nevada Adventures* (formerly the *Nevada Prospecting Company*), *The Dodge Construction Company*, Roy Primeau, Sam Zunino, his son and son-in-law, John Heizer and Charles Segerstrom. According to Ben Jackson of Nevada Adventures, Japanese importers, the *Ford Motor Company*, and the *Colorado Fuel and Iron Company* have requested sample shipments of the ore. Conferences are being held with the Western Pacific Railroad regarding the possibility of building spur lines from the main line to a point near the deposits. Another report concerning iron ore mining in Nevada comes from the Gabbs Valley area, Nye County, from which several carloads of ore are being loaded at Luning on the Southern Pacific Railroad line with the destination listed as Japan.

Numerous mining deals are in the making in Nevada now and reports on some of them follow: *Newmont Mining Corporation*, which closed its operation at Goldfield, Esmeralda County, is searching for another mine, with the emphasis on base metals and tungsten. The company has exploratory work under way at the *Groom* lead mine near Caliente in Lincoln County and at the *Seligman* lead-zinc mine at Hamilton, White Pine County. Examinations have been made of several other mines, some tungsten-bearing. Investigations are being supervised by Don Hargrove, who was superintendent of Goldfield operations. In Elko

County, the *Rip Van Winkle Consolidated Mines Company's* lead-silver-zinc property at Lone Mountain has been sold to Preston M. and R. K. Neilson and Lowell Thompson for a reported \$100,000. Included in the sale was the 100-ton-per-day flotation mill and mine equipment. The new owners expect to operate on a substantial basis. In Esmeralda County, the *Klondyke, Gold Milling and Mining* claims, and *Warrior* mine have been taken over by Ralph Wagner and Harold MacQuiddy. The *Buckhorn* group of manganese claims at Argentite has been leased by George Wilmont of Las Vegas. He is moving in equipment to begin openpit mining and plans to ship to *Geneva Steel's* Provo, Utah, plant. In northern Pershing County, Walter and William Polkinghorne of Winnemucca and Stewart and Hampton Brady, owners of three manganese claims in Pollard Canyon, are forming a new company with several other associates to develop the claims. A road is being built to the property and a contract for openpit mining has been awarded to George DeLong.

The *Nivloc* and *Argentite* silver-gold mines in the Silver Peak district of Nevada, reportedly may be opened by E. R. Hines of Goldfield and Avery Brundage of Chicago. Plans to open a lead property owned by E. M. Booth of Tonopah and located in Paymaster Canyon were also said to be contemplated by Hines and Brundage.

The *Needle Point* fluorspar mine, 50 miles southeast of Battle Mountain, Nevada, is being stripped by Ford T. Frost of Ogden, Utah. He is reported to have sent his first shipment to the Geneva, Utah, plant of Geneva Steel Company.



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# METAL AND MINERAL MARKETS

## METALS

		June 20
COPPER:	Electrolytic. Delivered F.o.b. cars, destination U.S.A.....	24.50¢
	Lake. Delivered, destinations U.S.A.....	24.625¢
	Foreign Copper. New York.....	27.50¢
LEAD:	Common Grade. New York.....	17.00¢
	Foreign Lead. New York, duty paid.....	17.75-23.00¢
ZINC:	Prime Western. East St. Louis.....	17.50¢
ALUMINUM:	Primary 30 pound Ingots (99% plus). F.o.b. shipping points.....	19.00¢
ANTIMONY:	Bradley Mining Co.'s Elk Brand 99.5%. F.o.b. Cascade, Idaho.....	50.00¢
	Lone Star Brand. F.o.b. Laredo, in bulk.....	42.50¢
COBALT:	97-99%, keg of 550 pounds.....	\$2.10
MAGNESIUM:	Ingots (99.8%). F.o.b. Freeport, Texas.....	24.50¢
MERCURY:	Flasks. Large lots, New York.....	\$210.00
NICKEL:	"F" Ingots (5 pounds). F.o.b. refinery, Port Colburne, Ontario.....	56.50¢
TIN:	Grade A Brands. New York.....	106.00¢
TITANIUM:	(98.5%). F.o.b. Beverly, Massachusetts.....	\$7.00
GOLD:	United States Treasury price.....	\$35.00 per ounce
SILVER:	Newly mined domestic. United States Treasury price.....	90½¢ per ounce
	Foreign. Handy & Harman.....	87.75¢ per ounce
PLATINUM:	.....	\$90.00-\$93.00 per ounce

## ORES AND CONCENTRATES

BERYLLIUM ORE:	10 to 12% BeO. F.o.b. mine, Colorado.....	\$35.00 per unit
CHROME ORE:	F.o.b. railroad cars eastern seaports. Long tons dry weight.	
	African (Rhodesian). 48% Cr <sub>2</sub> O <sub>3</sub> . 3 to 1 chrome-iron ratio.....	\$41.00-\$42.00
	African (Transvaal). 48% Cr <sub>2</sub> O <sub>3</sub> .....	\$34.00-\$35.00
	Turkish. 48% Cr <sub>2</sub> O <sub>3</sub> . 3 to 1 chrome-iron ratio.....	\$48.00-\$49.00
IRON ORE:	Lake Superior. Per gross ton Lower Lake Ports.	
	Mesabi, Non Bessemer, 51.5% Fe.....	\$8.30
	Mesabi, Bessemer, 51.5% Fe.....	\$8.45
	Old Range, Non Bessemer.....	\$8.55
	Old Range, Bessemer.....	\$8.70
MANGANESE ORE:	Metallurgical grade. 46% Mn. Long ton unit.....	\$1.05
	Chemical grade. 80% MnO <sub>2</sub> . Per ton.....	\$60.00
	Chemical grade, domestic, 70% MnO <sub>2</sub> , F.o.b. mines.....	\$45.00
MOLYBDENUM CONCENTRATE:	90% MoS <sub>2</sub> . F.o.b. Climax, Colorado. Per pound of contained molybdenum.....	\$1.00
TUNGSTEN CONCENTRATE:	60% WO <sub>3</sub> . Per short ton unit.....	\$65.00
URANIUM ORE:	Carnotite-Roscoelite. F.o.b. purchase depot plus \$0.06 per ton mile (maximum of \$6.00), Rifle, Naturita, Uravan and Durango, Colorado; Salt Lake City and Monticello, Utah. Base price for 0.10% ore is \$1.50 per pound and ranges to \$3.50 per pound of contained U <sub>3</sub> O <sub>8</sub> plus \$0.75 per pound for each pound in excess of four pounds per short dry ton and an extra allowance of \$0.25 per pound for each pound in excess of 10 pounds. A development allowance of \$0.50 per pound is paid for all ores purchased.	
VANADIUM ORE:	Carnotite-Roscoelite. V <sub>2</sub> O <sub>5</sub> content, up to 10 pounds, in uranium ore paid for at \$0.31 per pound in ratio of 10 parts V <sub>2</sub> O <sub>5</sub> to 1 part U <sub>3</sub> O <sub>8</sub> .	

## NON-METALLIC MINERALS

BENTONITE:	Minus-200-mesh. F.o.b. Wyoming points. Per ton in carload lots.....	\$12.50
	Oil Well grade. Packed in 100 pound paper bags.....	\$14.00
FLUORSPAR:	Metallurgical grade. 70% effective CaF <sub>2</sub> content per short ton F.o.b.	
	Illinois-Kentucky mines.....	\$43.00
	Ceramic grade. Minimum CaF <sub>2</sub> content, 95%.....	\$45.00
	Acid grade. 97% CaF <sub>2</sub> .....	\$50.00
PERLITE:	Crude: F.o.b. mine per short ton.....	\$3.00 to \$5.00
	Plaster grades. Crushed and sized. F.o.b. plants	
	per short ton.....	\$7.00 to \$9.00
	Concrete grades. Crushed and sized.....	\$6.00 to \$8.00

Quotations on metals and certain ores through the courtesy of *American Metal Market*, New York, N.Y.

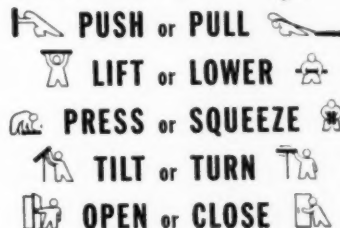
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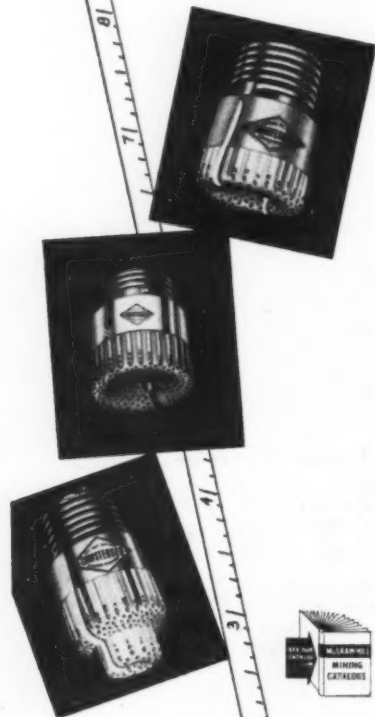


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vary 1, 1951, a total of 1,190,927 man-hours in drilling and blasting, 9,000,000 lineal feet of drill holes with the use of 36,155,608 pounds of explosives and the breaking of 181,593,141 tons of material.

*International Minerals and Chemical Corporation* has begun sinking its fourth shaft at Carlsbad, New Mexico, and is planning to increase by one-third the capacity of its chemical plant. The company is involved in an expansion program to total \$3,275,000. The No. 3 shaft is nearly completed and had been sunk to a depth of 850 feet at last reports. The loading pocket will be at 917 feet and the floor of the station at 843 feet. The company is extending a drift to connect the No. 1 and No. 3 shafts. The No. 4 shaft will cost \$500,000 and surface installations an additional \$410,000. The increase in capacity of the chemical plant will cost about \$100,000. A new storage building is the main item of this expansion and will house refined pure potassium chloride. A special rail siding will be run to the building and special conveying equipment installed. The company also plans to spend \$100,000 on a new office building.

Manganese mines and a plant at Deming, New Mexico, will be reopened by private industry with government help, according to reports of a conversation between Secretary of the Interior Oscar Chapman and Clinton Anderson, New Mexico Senator. Another New Mexico Senator, Dennis Chavez, has advised that the *U. S. Atomic Energy Commission* and the U. S. Army are studying the need for more roads from Los Alamos to Santa Fe and Albuquerque.

D. H. Abel reportedly is doing development work on his low-grade copper property in the Copper Hill area, near Dixon, New Mexico.

George Koepke and H. B. Jones of Winston have leased the old Pelican group of claims in the Hermosa (Palomas) mining district. They recently shipped 17½ tons of silver-lead-zinc ore taken from the *Nana* mine and dump to the *American Smelting and Refining Company's* concentrating plant at Deming. They plan to develop old workings in the group in search of high grade silver-lead ore chutes that made the district famous. Part of the holdings have been subleased.

In Santa Fe's County's (Cerrillos) lead-zinc mining district, the *Santa Fe Lead-*

*Zinc Mines, Ltd.*, and the *Pennsylvania Group* owned by Verne Byrne of Santa Fe, both World War II producers, reportedly are ready to operate on short notice to supply those critical ores. The former holds about 200 acres that include the *Tom Payne*, *Bottom Dollar* and *Hornet* mines.

The *Peru Mining Company* is operating its mill at Deming, New Mexico, at full capacity of 1,000 tons of zinc ore per day. Of this amount, more than two-thirds comes from the company's *Kearney* and *Pewabic* mines. The remainder is custom ore. A program for exploration and intensified development is now in progress in search of additional ore reserves.

The *Copper Hill Mining Company* has begun shipping ore from its *Mirabal* copper property near Grants, New Mexico. The 600-ton production is going to the ASARCO smelter at El Paso, Texas.



Accelerated tax amortization has been authorized by the Defense Production Administration for the *American Smelting & Refining Company* for use at Corpus Christi and Houston, Texas. The company applied for \$700,000 for construction of a plant at Corpus Christi to make sulphuric acid. DPA said \$610,375 of the amount was eligible and 70 percent certified. The company applied for \$127,944 for facilities to produce magnesium alloy ingots at Houston and was eligible for the entire amount with 75 percent certified.

*R. G. LeTourneau, Inc.*, is constructing its own steel mill at its plant at Longview, Texas, and the National Production Authority has granted a certificate of necessity to the company. The mill will turn out 1,000 tons per day of finished steel plate, 144 inches wide, and from 3/16 to 12 inches in thickness. The complete rolling mill, which will be part of the installation, will have rollers from 36 inches to 58 inches in diameter and 156 inches long. The mill will be powered by an 8,000 hp. unit.

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**Sneffels District**  
 (Continued from Page 22)

trude, Una, Crusader, Conqueror, Monument, Emily and Norma and did the requisite amount of assessment work. Weston spent each evening testing the ore mined that day. The two stayed four years in their isolated cabin, developing their claims, but finally wearied of the long climb up to their diggings and willingly conveyed the Una claim to H. W. Reed and his brother Caleb. The new owners agreed to drive a crosscut tunnel to intersect the Gertrude and Una vein 150 feet below its outcrop. The tunnel cut the vein where it pinched out and work was abandoned. In 1881, W. C. Coman, a mining engineer, visited the Weston and Barber claims and bought them for \$50,000.

Fifteen years later, in Sept., 1896, Thomas F. Walsh needed flux for his pyritic smelter in Silverton and began combing the mountains in search of "some low grade dumps carrying sufficient gold or silver values to pay for their freight to Silverton." He and an old friend, Andy Richardson, rode up the mountainside to examine some claims and found the slide of reddish pyritic porphyry which had run over the Gertrude property. Richardson brought from it some samples of pure white quartz,

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 Core and Churn Drill Contractors

streaked with seams of black telluride which, when tested, ran as high as \$3,000 to the ton. Walsh, upon learning the value of the samples, bought all the old claims in the immediate vicinity for \$20,000 and soon after began to rework the Gertrude. He allowed Richardson to stake an adjoining claim, which the latter called the Camp Bird. Walsh then gave this name to his consolidated properties. By 1900 he owned 103 mining claims and 12 millsites covering 941 acres of ground. The Camp Bird vein varied in width from three to 14 feet and "everything was milled from wall to wall." By Dec., 1897, a 20-stamp mill (later enlarged to 40 stamps) was in operation and a 9,000-foot-long aerial tram connected mine and mill.

Two years later a boardinghouse was serving meals to 400 men. It was a "veritable hotel which furnished from 15 to 50 transient people daily with free meals. It was 'open house' for native and stranger alike. All complacently walk in and partake of the hospitality of the Camp Bird Hotel . . . 11,000 feet above sea level, as if paying \$3.00 rates. All other mining boardinghouses charge from 25 to 35 cents a meal."

The Camp Bird mine is located high on the mountainside above the clustered, red-roofed buildings which comprise the mill. At No. 1 and No. 2 tunnels, boardinghouses were built and every winter snow-slides thundered over them, or swept near them, sometimes crushing them like a stack of cards. No. 2 boardinghouse was in the path of an annual slide, but it was so built into the mountain that its roof conformed to the slope of the hill and offered no obstacle. "Avalanches passed harmlessly over it, except for carrying away its smokestack, of which a supply was kept on hand.

In 1902 the Camp Bird was sold to an English syndicate (the Venture Co.) for \$5,000,000. In less than four years \$500,000 had been spent on surface improvements and an estimated \$7,000,000 worth of ore had been developed in the mine workings. The mine's production record through July, 1900, was \$2,535,512 and its profit was \$1,650,000. By 1911 the English company had realized \$18,000,000 (all that it expected to receive) and was talking of closing the mine. In 1916 and 1917 rich bodies of ore were discovered and new veins were cut. Since 1916 the mine has been worked by several companies—currently the King Lease, Inc., is operating it.

# THE MARKET PLACE

## MINING AND MILLING MACHINERY ELECTRICAL, INDUSTRIAL and CONSTRUCTION EQUIPMENT

### JAW CRUSHERS

- 2-8"x8" Universal #2
- 1-8"x24" Rogers, cast steel
- 1-8"x36" Universal, all steel
- 1-15"x28" Pacific, all steel
- 1-9"x15" Farrell Blake
- 1-9"x36" Cedar Rapids
- 1-13"x24" TelSmith

### LOCOMOTIVES

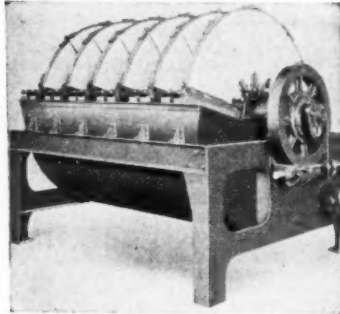
- 2-2 to 2½-ton Mancha Battery Locomotives, 18" gauge
- 1-2½-ton Whitcomb Battery Locomotive, 24" gauge
- 2-7-ton General Electric Battery Locomotives, 36" gauge
- 2-8-ton General Electric Battery Locomotives, 36" gauge
- 4-10-ton Atlas Battery Locomotives, 36" gauge
- 1-3-ton Ruth Gasoline Locomotive, 18" gauge
- 1-3-ton Whitcomb Gasoline Locomotive, 24" gauge
- 1-6 ton Goodman Trolley Locomotive

### TUGGER HOISTS

- 1-Dillon-Box #3, 1,000± air tugger
- 2-Gardner-Denver Model HB air tugger
- 1-Ingersoll-Rand, size EU, air tugger
- 1-Ingersoll-Rand, Model 6HC, air tugger
- 1-Ingersoll-Rand, 2 drum, size SNH-OH electric tugger
- 2-Sullivan, class RH electric tuggers
- 1-Ingersoll-Rand, size 107, electric tugger
- 1-Sullivan, Model B-211, 2 drum, electric tugger
- 1-Ingersoll-Rand new size 20-MNM-2D, 3 drum, electric slusher hoist
- 3-7½ HP Sullivan electric tuggers
- 9-7½ HP Sullivan double drum electric tuggers

### FILTERS

- 1-4' 1-disc Oliver United continuous filter
- 2-6' 2-disc American continuous filter
- 1-4'x6' Morse Bros. continuous drum filter
- 2-8'x12' Einco continuous drum filter



1-36" Merrill triangular leaf filter press

1-#12 Sweetland 36 leaf filter press

### FLOTATION MACHINES

- 1-Morse new "Jetair" hydra cell
- 2-2 cell Denver Equip. #21 flotation machines
- 1-3 cell Denver Equip. #21 flotation machine
- 2-6 cell Denver Equip. #21 flotation machines
- 1-8 cell Denver Equip. #21 flotation machine

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- 1-1" Willley Sand Pump
- 5-2" Willley Sand Pumps
- 1-2" Denver vertical Sand Pump
- 2-2" Telluride Sand Pumps
- 1-2½" Traylor Sand Pump
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- 1-4"x4" Standard ball mill
- 1-5"x4" Colorado Iron Works ball mill
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- 1-5½" and 5½" x 2½" Worthington
- 1-4½" and 4½" x 2½" new Worthington
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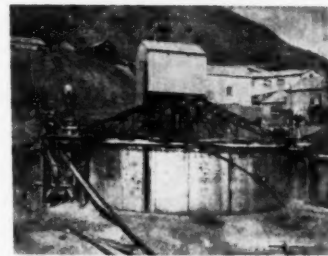
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**ARKANSAS MANGANESE:** 597 acres land. Mines producing four grades of manganese ore. Short distance to railroad shipping point. Mining engineer's report will be furnished if party is really interested. Price \$160.00 per acre. E. H. Fair, Rt. 2, Box 77, Conway, Arkansas.

**TUNGSTEN MINING CLAIMS** for sale, lease or option, to reliable party. Sensational new discovery. For particulars contact sole owner, Box 86, Payson, Arizona.

**FOR SALE:** Placer mining claims. Coarse gold in nuggets up to two ounces with platinum and chrome. Must sell immediately. Sacrifice price of \$70,000 includes 5-ton ball mill and other equipment on claims. Reply Box G-3, MINING WORLD, 121 Second St., San Francisco 5, California.

**FOR SALE:** Gold, silver property, in Southwestern Colorado, that has merit. Developed by two tunnels 2400 feet and 1900 feet. Reply Box G-6, MINING WORLD, 121 Second St., San Francisco 5, Calif.

**Sale or Lease:** 22 placer claims. Tested by pits, plenty of water the year around. Can be worked about ten months in a year. 110 miles east of Lewiston, Idaho. Property is clear of indebtedness. Can be worked by drag-line or bucket-dredge. Gold assayed 840 fines. Tests show about 20¢ per yard. Railroad in 20 miles. George Harbison, Route 2, Box 738, Lewiston, Idaho.

**FOR SALE:** Six claims scheelite, lead, zinc, silver. Open pit and underground property. 25 miles from railroad. Good mountain road. G. W. Frasier, Weiser, Idaho.

### Positions Available

**COPPER SMELTER SUPERINTENDENT.** For new copper smelter in North-eastern Turkey. Must be familiar with coal fired reverberatory furnaces and horizontal converters. Good living conditions and excellent climate. Box No. G-2, MINING WORLD, 121 Second St., San Francisco 5, California.

**MAINTENANCE ENGINEER—COPPER REFINERY.** New copper smelter in Northeastern Turkey. Must be familiar with coal fired reverberatory furnaces and horizontal converters. Good living conditions and excellent climate. Reply Box No. G-1, MINING WORLD, 121 Second St., San Francisco 5, California.

**EXPERIENCED MAN** to superintend operation of large, modern iron ore concentrator in Minnesota. Must be familiar with modern ore-dressing processes and equipment. State experience, references, salary desired, etc. Reply Box F-3, MINING WORLD, 121 Second St., San Francisco 5, Calif.

**GEOLOGISTS.** Large corporation desires services of several senior geologists, having five to ten years' experience in mineral examination and exploration work. Salary open, commensurate with experience. Please submit complete resume of educational background and professional experience to Box E-1, MINING WORLD, 121 Second St., San Francisco 5, Calif.

### Equipment For Sale

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**FOR SALE OR TRADE:** Pneumatic tired double-drum mine hoist, 5th wheel steer, starter and lights, cat-head, slusher scraper and snatch blocks included. Trade for late pickup or sell \$1,000.00 cash. Reply Box 11, Daggett, Calif.

3864 Ft. New C.P. Electric Air Compressor. 5'x22", 6'x22", 6'x36", 8'x22" and 8'x36" Hardinge Ball Mills.  
443 KVA 2300 V. Worth Diesel Gen.  
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18x36, 24x36 and 42x48 Jaw Crushers.  
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5x8, 6x6, 7x5, 8x6 and 8x11 Cylindrical Ball Mills.  
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1250 KVA Nordberg 2300 V. Diesel.  
4'x45' & 6'x60' Rotary Kilns.  
190 KVA 440 V. Baldwin Diesel.  
Double Drum Mine Hoist 400 H.P.  
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12	350
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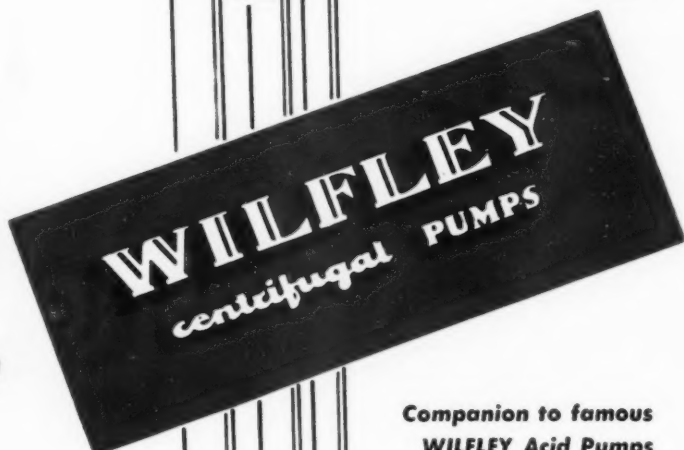
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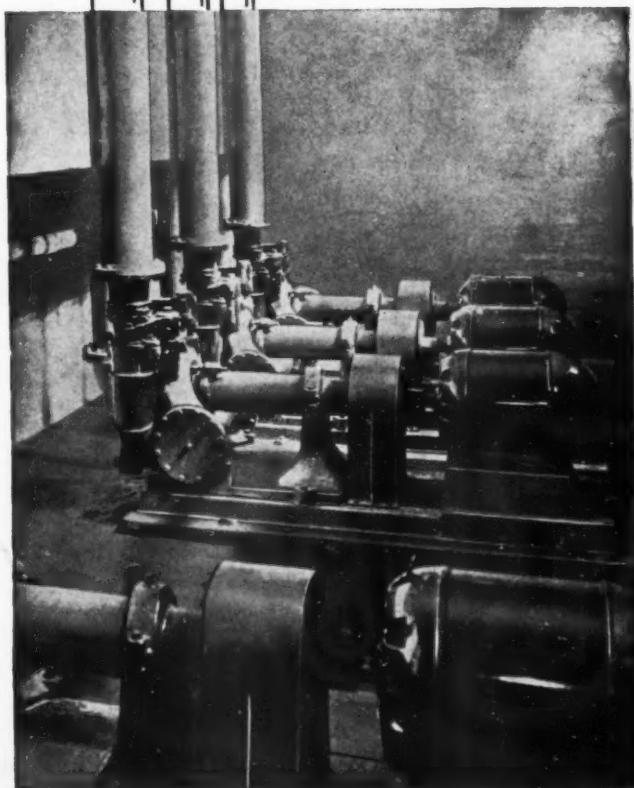
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